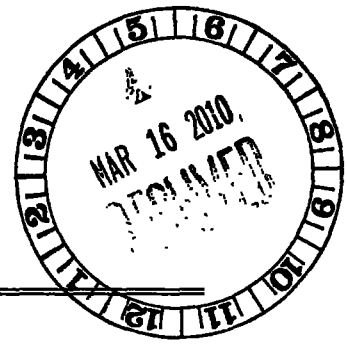

BEFORE THE
SURFACE TRANSPORTATION BOARD

ARKANSAS ELECTRIC COOPERATIVE CORPORATION – PETITION FOR DECLARATORY ORDER	)	Finance Docket No. 35305

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OPENING EVIDENCE AND ARGUMENT OF WESTERN COAL TRAFFIC LEAGUE AND CONCERNED CAPTIVE COAL SHIPPERS

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Dated: March 16, 2010

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OPENING EVIDENCE AND ARGUMENT OF WESTERN COAL TRAFFIC LEAGUE AND CONCERNED CAPTIVE COAL SHIPPERS

In response to the Board's decision served in this proceeding on December 1, 2009 ("*December '09 Decision*"), the Western Coal Traffic League ("WCTL") and the Concerned Captive Coal Shippers ("CCCS") (collectively "Coal Shippers") present the following joint opening evidence and argument.

SUMMARY

Through testimony of four distinguished expert witnesses and numerous documents provided by BNSF, Coal Shippers present numerous arguments demonstrating that the coal dust mitigation requirements BNSF Railway Company ("BNSF") seeks to establish by tariff constitute an unreasonable practice. First, rather than representing reasonable and well-founded responses to supposed safety concerns, the tariff items are simply an effort by BNSF to impose upon its customers and their coal suppliers unprecedented requirements in order to reduce its own normal costs for roadbed maintenance. Second, the standards BNSF has developed to implement this shift in

responsibility for roadway maintenance are demonstrably and grossly arbitrary and lacking in any scientific validity. Third, though BNSF might succeed in reducing its own costs, the effect of its tariff requirements would be to increase greatly the societal cost of dealing with coal dust, which is most economically addressed through the traditional and longstanding ballast maintenance practices upon which BNSF and the rest of the railroad industry have relied. Fourth, there are no proven methods to comply with the new coal dust tariff requirements. Fifth, BNSF has not publicly revealed any enforcement policy for the new requirements and its requirements cannot be deemed reasonable in the absence of an understanding of the consequences of non-compliance.

Coal Shippers also demonstrate that if BNSF is permitted to impose its new tariff requirements, BNSF must be required to provide allowance to its shippers to compensate them for the reasonable cost of steps they take in order to comply, because the shippers would be forced to undertake these costs in order to perform obligations belonging to BNSF as a common carrier. Finally, under the law and established precedent, as a common carrier, BNSF may not refuse to provide service to a coal shipper if the shipper fails to comply with BNSF's coal dust tariff requirements.

IDENTITY AND INTEREST

WCTL is an association whose membership is comprised of organizations that purchase and transport coal mined west of the Mississippi River. WCTL members transport over 140 million tons of coal annually, nearly all of which moves by rail. WCTL has actively participated for many years before the Surface Transportation Board

("STB" or "Board") and its predecessor, the Interstate Commerce Commission ("ICC"), including in proceedings addressing substantive and procedural rules governing railroad regulatory and cost reporting requirements, and on initiatives designed to prevent railroad practices or conduct that contravenes the law.

CCCS is an ad hoc group of coal shippers that has participated in a number of major STB proceedings in recent years. For purposes of the instant proceeding, CCCS includes the following entities: (1) American Electric Power Service Corporation; (2) Consumers Energy Company; (3) Dairyland Power Cooperative; (4) Dynegy, Inc.; (5) Entergy Arkansas, Inc., Entergy Gulf States Louisiana, L.L.C., and Entergy Services, Inc.; (6) Intermountain Power Project; (7) Progress Energy, Inc.; (8) Seminole Electric Cooperative, Inc.; (9) South Carolina Public Service Authority (Santee Cooper); and (10) South Mississippi Electric Power Association. Each entity consumes large volumes of coal to generate electricity and relies upon rail carriers to transport that coal. Each, by virtue of its circumstances, has a strong interest in the subject matter of this proceeding. In some instances, that interest arises because the entity ships coal via BNSF. In other instances (*e.g.*, CCCS members shipping coal solely via eastern carriers), that interest arises from concern that other rail carriers may implement similar unreasonable coal dust limitations in the future if BNSF is permitted to proceed with its challenged coal dust tariff items.

Descriptions of the individual members of CCCS and their coal generation and transportation circumstances appear in Appendix A to this filing.

BACKGROUND

The pertinent background facts are as follows:

A. The Involved Tariffs

On December 11, 2006, BNSF issued a tariff item, effective on January 1, 2007, which called for rail shippers to be "responsible for loading railcar[s] . . . so that lading will not be released, discharged or inadvertently removed from the railcar during rail carrier handling":

> Shipper is responsible for loading railcar[s], including private railcars, so that lading will not be released, discharged or inadvertently removed from railcar[s] during rail carrier handling, and shipper is responsible for the removal and/or remediation of lading released on BNSF property, including indemnifying BNSF from any and all associated and related costs, expenses, levied fines and/or penalties.

BNSF Rules Book 6100-A, Item 3035, entitled "BNSF Railcar Loading Rules."

In an apparent effort to implement this new "loading" rule, BNSF issued a second tariff item on April 29, 2009 stating that, as of November 1, 2009, coal shippers obtaining service over the Joint Line in the Powder River Basin ("PRB") would be required to "ensure" that loaded coal trains moving over the Joint Line be loaded to meet a specified loading "profile[]" and to "ensure" that loaded coal trains moving over the Joint Line "not emit more than an Integrated Dust Value (IDV.2) of 300 units":

> Shipper shall ensure that all cars loaded with coal from any mine origin that move over the Joint Line in the Powder River Basin ("PRB") shall be profiled in accordance with BNSF's published template entitled "Redesigned Chute Diagram" located in Appendix A to this publication. The template may also be found on the BNSF website (www.bnsf.com) using

> the following tabs: Customer Tools, Equipment Information, Loading Diagrams, Coal.
>
> Effective November 1, 2009, Shipper shall take all steps necessary to ensure that Trains handling cars loaded with Coal from any mine origin that move over the Joint Line shall not emit more than an Integrated Dust Value (IDV.2) of 300 units in order to enhance retention of coal in rail cars. An IDV.2 unit is a measure of the volume of coal dust coming off of the coal train over its entire length. Profiling and any products or appurtenances shall be applied or installed in accord with manufacturer's recommendation, where appropriate.
>
> Any product, device or appurtenance utilized by Shipper or Shipper's mine agents to control the release of coal dust shall not adversely impact railroad employees, property, locomotives or owned rail cars.

BNSF Price List 6041-B, Item 100, entitled "Coal Dust Mitigation Requirements" ("Joint Line Coal Dust Tariff Item").

Shortly thereafter, BNSF published a third tariff item, BNSF Price List 6041-B, Item 101, entitled "Coal Dust Requirements Black Hills Sub-Division" (issued May 27, 2009) ("Black Hills Coal Dust Tariff Item"). In this tariff item, BNSF extended the Joint Line train profiling and Integrated Dust Value ("IDV" or "IDV.2") requirements to trains operating on BNSF's Black Hills Subdivision ("Black Hills Line"), but established a different IDV.2 standard (245 units) to apply to trains moving over the Black Hills Line:

> Shipper shall ensure that all cars loaded with coal from any mine origin that move over milepost 558.2 on the Black Hills Subdivision in Wyoming shall be profiled in accordance with BNSF's published template entitled "Redesigned Chute Diagram" located in Appendix A to this publication. The template may also be found on the BNSF website

(www.bnsf.com) using the following tabs: Customer Tools, Equipment Information, Loading Diagrams, Coal.

Effective November 1, 2009, Shipper shall take all steps necessary to ensure that Trains handling cars loaded with Coal from any mine origin that move over the Black Hills Subdivision shall not emit more than an Integrated Dust Value (IDV.2) of 245 units in order to enhance retention of coal in rail cars. An IDV.2 unit is a measure of the volume of coal dust coming off of the coal train over its entire length. Profiling and any products or appurtenances shall be applied or installed in accord with manufacturer's recommendations, where appropriate.

Any product, devise or appurtenance utilized by Shipper or Shipper's mine agents to control the release of coal dust shall not adversely impact railroad employees, property, locomotives or owned rail cars.

In conjunction with the publication of these tariff items, BNSF has adopted

{

}[1]

Union Pacific Railroad Company ("UP") {

}[2]

B. The Initial STB Proceedings

On October 2, 2009, Arkansas Electric Cooperative Corporation ("AECC") filed a petition asking the Board to institute a declaratory order action, and, at the conclusion of that proceeding, to find that BNSF's publication of the Joint Line Coal Dust Tariff Item and its publication of the Black Hills Coal Dust Tariff Item (collectively "Coal Dust Tariff Items") constituted unreasonable practices in violation of 49 U.S.C. §

[1] *See* "Orin Subdivision General Order No 19 Coal Dust.Txt," produced by BNSF in Native format on February 4, 2010 (disk 2), at 5.

[2] UP-AECCBN-0006834-6835.

10702 and unlawfully limited BNSF's common carrier obligation to provide service in violation of 49 U.S.C. § 11101. AECC also requested that the Board enjoin BNSF from enforcing the Coal Dust Tariff Items pending the Board's resolution of the requested declaratory order proceeding.

In support of its petitions, AECC argued, *inter alia,* that coal dust was properly viewed as a maintenance of way issue; that BNSF should address coal dust issues through better maintenance of its rail lines; that BNSF's IDV.2 dust collection and measurement standards were totally arbitrary; that there was no proven means to meet the IDV.2 standards; that the cost of spraying coal in an effort to meet these standards could cost rail shippers in excess of $100 million annually; and that BNSF's threat to stop transporting trains that failed to meet the profiling and IDV standards would threaten the viability of the nation's energy and electricity supply. *See* AECC Petition for a Declaratory Order at 1-6 (filed Oct. 2, 2009).

BNSF filed replies to AECC's petitions on October 21, 2009. In these replies, BNSF opposed AECC's request for injunctive relief but nevertheless informed the Board that it was "suspending" the November 1, 2009 effective date of the Coal Dust Tariff Items "until August 1, 2010." (BNSF Reply in Opposition to AECC's Petition for Stay at 2). BNSF also informed the Board that it "endorse[d]" the Board's institution of a declaratory order proceeding to address the legality of its Coal Dust Tariff Items. (BNSF Reply to AECC's Petition for a Declaratory Order at 2).

In support of its positions, BNSF argued, *inter alia*, that coal dust being emitted from rail cars was a major contributing factor to the derailments that occurred on

the Joint Line in 2005; that its coal dust emission standards were necessary to protect public safety; that BNSF had collected data from "thousands of trains" in formulating its coal dust emission standards; that these standards were intended to "protect against the fouling of the ballast;" and that these standards were supported by "painstaking scientific and engineering research." *Id.* at 1, 5 and 7. BNSF also claimed that AECC's concerns about BNSF stopping service for non-compliant shippers was "entirely speculative" because "BNSF has not announced plans for enforcing compliance with its coal dust emissions standards." (BNSF Reply to AECC's Petition for Stay at 2).

On October 22, 2009, WCTL submitted a letter to the Board supporting AECC's declaratory order petition. WCTL also moved to intervene and requested that the Board "provid[e] the opportunity for all interested coal shippers to participate" in the declaratory order proceedings because these proceedings raised "questions of industry-wide importance." *Id.* at 2. Separately, UP moved to intervene in this case, but opposed WCTL's intervention on grounds that discussions between railroads and WCTL concerning the Coal Dust Tariff Items "pos[ed] antitrust risk." (Reply of UP to WCTL's Request to Intervene at 1, filed October 27, 2009).

Following its review of BNSF's October 22, 2009 filing, AECC moved to withdraw its petition for injunctive relief on grounds that this request had been mooted by BNSF's decision to suspend the effective date of the Coal Dust Tariff Items. The Board granted AECC's motion on October 29, 2009. The Board subsequently addressed other pending issues in a decision served on December 1, 2009 (*"December '09 Decision"*).

In the *December '09 Decision*, the Board granted AECC's petition to institute a declaratory order proceeding and identified three issues raised in the parties' pleadings: "(1) whether the [Coal Dust] Tariff provisions constitute an unreasonable rule or practice; (2) whether BNSF may establish rules designed to inhibit the dispersion of coal dust from coal trains operating over its lines; and (3) whether refusal to provide service for non-compliance with the [Coal Dust] Tariff provisions or other actions to enforce compliance would violate BNSF's common carrier obligation." *Id.* at 1.

The Board also granted WCTL's request that this proceeding be opened up for participation by all interested parties because of the vital public interests at stake. *Id.* ("Due to the vital role coal transportation plays in the nation's energy supply and economy in general, the Board seeks public comment and participation on this matter."). Finally, the Board adopted a procedural schedule calling for discovery followed by three rounds of party submissions.

C. Recent Developments

Following the Board's *December '09 Decision*, Coal Shippers filed notices of intent to participate in this proceeding. Coal Shippers also submitted discovery requests to BNSF and UP. BNSF and UP have supplied interrogatory answers and documents in response to these requests. The vast majority of the documents produced have been designated by BNSF and UP as "Confidential" or "Highly Confidential" under the governing protective order.

ARGUMENT

The Board should find that BNSF's Coal Dust Tariff Items are unlawful because they constitute unreasonable practices. Alternatively, if the Board finds the Tariff Items to be reasonable, the Board should order BNSF, and UP (if UP attempts to enforce the Tariff Items), to pay coal shippers an allowance equal to the reasonable sums they incur in attempting to comply with the Tariff Items. Finally, the Board should rule that under no circumstances can a rail carrier providing common carrier service refuse to provide service simply because a shipper has failed to comply with a dust emission standard published by a rail carrier.

I.

BNSF'S COAL DUST TARIFF ITEMS ARE UNREASONABLE

49 U.S.C. § 10702(2) provides that "a rail carrier providing transportation or service subject to the jurisdiction of the Board under this part shall establish reasonable . . . rules and practices on matters related to that transportation or service." The Board "has developed no single test for judging whether a particular practice is unreasonable." *WTL Rail Corp. – Petition for Declaratory Order and Interim Relief*, STB Docket No. 42092 (STB served Feb. 17, 2006) at 6. Instead, the Board conducts a "case-by-case analysis" (*id.*) and "tailor[s] its analysis to the evidence proffered and arguments asserted under a particular set of facts." *North America Freight Car Ass'n v. BNSF Ry.*, STB Docket No. 42060 (Sub-No. 1) (STB served Jan. 26, 2007) at 8.

Here, both the facts and the law unequivocally demonstrate that BNSF's Coal Dust Tariff Items constitute an unreasonable practice because (1) despite BNSF's

contentions to the contrary, the real issue here is how best to maintain BNSF's railroad and who is responsible for doing so; (2) BNSF can safely and efficiently maintain its railroad (and properly address coal dust issues) with accepted, long standing maintenance practices, including ballast undercutting; (3) BNSF's coal dust emission and profiling standards impose arbitrary coal dust mitigation standards on coal shippers that find no support whatsoever in sound science or statistical analysis; (4) BNSF's Coal Dust Tariff Items constitute a deliberate effort on BNSF's part to make shippers double pay or triple pay for ballast maintenance, once in their rates (which reflect payment for current coal dust mitigation practices), a second time when they incur ballast maintenance costs in the form of the costs to spray coal in an effort to comply with the Coal Dust Tariff Items and possibly a third time if they are forced to pay penalties to BNSF for non-compliant trains; and (5) BNSF has arbitrarily refused to publish proposed tariff standards explaining how it plans to enforce the Coal Dust Tariff Items.

Coal Shippers' arguments are supported by verified statements ("V.S.") submitted by four expert witnesses, each of whom is a leading authority in his field. These witnesses are:

- **Richard H. McDonald** – Mr. McDonald is a professional engineer with over 40 years of experience in the railroad engineering, maintenance and operation fields. Of particular importance in this case, Mr. McDonald has extensive experience and expertise relating to maintenance and engineering practices on PRB coal lines. Among other things, Mr. McDonald was responsible for all facets of the Chicago & North Western Railway's ("CNW") construction in the early 1980's of more than 100 miles of

new lines and facilities needed for CNW to access the Wyoming PRB; Mr. McDonald subsequently served as CNW's principal coordinator with BNSF on Joint Line operations and maintenance issues; and following his retirement from CNW in 1994 has engaged in numerous consulting projects concerning maintenance and operation of the Joint Line, and other PRB coal lines.

- **Dr. Mark J. Viz** – Dr. Viz is a graduate of the Massachusetts Institute of Technology and obtained a doctorate in theoretical and applied mechanics from Cornell University. Dr. Viz has is one of the nation's foremost experts on PRB track fouling issues and, in prior consulting assignments, has extensively studied BNSF's IDV.2 and train profiling procedures.

- **Dr. Gary M. Andrew** – Dr. Andrew is an expert on theoretical and applied statistics, sampling and operations research. Dr. Andrew's consulting assignments have included the development of mathematical models of economic systems, the development of statistical sampling procedures and the development of statistical models for analyzing the relationships between costs and volumes in large data bases.

- **Thomas D. Crowley** – Mr. Crowley is an economist and is President of L.E. Peabody & Associates, Inc, an economic consulting firm. Mr. Crowley has extensive experience in developing rail costs in general, and the costs of Powder River Basin coal transportation in particular. During his thirty nine year professional career, Mr. Crowley has presented expert testimony before the STB, and its predecessor agency, in all major proceedings involving Powder River Basin coal transportation.

A. The Issues Raised Here Involve Rail Maintenance Costs Not Rail Safety or Clean Air Issues

In its prior filings in this case, BNSF has argued that rail safety concerns require that BNSF issue tariff rules limiting coal dust emissions from rail cars.[3] Others have implied that coal dust emissions raise clean air issues. Neither of these assertions is correct. The real issue here is how best to maintain rail ballast, and how payments for ballast maintenance should be structured.

1. Rail Safety is Not an Issue

Railroads have transported coal safely in open top cars for over 100 years. In order to do so, railroads must properly maintain their rail lines. These maintenance procedures include regular cleaning of the ballast to remove foreign material on the ballast surface and periodic undercutting of the ballast. Undercutting involves removal of fouled ballast, screening out fines (including coal dust) and returning the cleaned ballast to the roadbed. *See* McDonald V.S. at 5.

Coal Shippers asked Richard H. McDonald, one of the nation's leading experts on rail engineering practices, whether BNSF and other coal carriers could continue to transport coal safely by properly employing longstanding industry-standard ballast cleaning and ballast undercutting procedures or whether, as BNSF now asserts, new coal dust emission standards are necessary for safe transportation of coal. Mr.

[3] *See, e.g.*, BNSF Reply to AECC's Petition for a Declaratory Order at 1 (claiming coal dust emission standards are necessary "to avoid safety hazards").

McDonald concluded unequivocally that emission standards are not necessary if railroads like BNSF properly maintain their lines using traditional maintenance procedures:

> In my considered opinion, it is not necessary to inhibit or even prevent coal dust deposition into the roadbed from passing trains (e.g, by spraying a surfactant to bind the surface of the coal in railcars as a train is being loaded at the mine) to keep coal dust from becoming a train safety problem on high-density coal lines such as the Joint Line. If proper track and roadbed maintenance procedures . . . are followed, accumulation of substantial quantities of coal dust (and other fines) in the roadbed is prevented, proper drainage is not impeded, and the track structure and associated ballast does not become unstable.

McDonald V.S. at 6.

BNSF also argues that coal dust emission standards are necessary in order to avoid "future derailments" similar to the two derailments that occurred on the Joint Line in May of 2005.[4] However, as Mr. McDonald explains, BNSF did not properly maintain the Joint Line for many years prior to the 2005 derailments because it did not follow proper ballast maintenance procedures. McDonald V.S. at 7. Mr. McDonald further observes that following the 2005 derailments, BNSF improved its ballast maintenance performance so that "coal dust (and other fines) have not been allowed to re-accumulate in anything approaching the quantities that had accumulated by May of 2005." *Id.* at 8. As a result, "there have been no derailments [on the Joint Line] attributable to fouling of ballast by accumulation of coal dust and other ballast contaminants." *Id.*

[4] *Id.* at 5.

Mr. McDonald's {

}. All of these documents have been designated as "Confidential" or "Highly Confidential" under the governing protective order. As discussed in detail in Appendix B, these documents {

}

Mr. McDonald's conclusions concerning the causes of the two May 2005 derailments are fully supported by reports prepared by, or submitted to, the Federal Railroad Administration ("FRA"). *See* App. B. at 6-14. One of the two derailments took place on May 15, 2005 at Joint Line milepost 63.3 and involved a UP train. The FRA's May 15, 2005 Railroad Accident Report concerning this derailment concluded that the derailment was caused by poor maintenance procedures, specifically, a defective field weld. *See* App. B at 7. The FRA also "recommend[ed] prosecution of BNSF for civil penalties for failure to comply with the Continuous Welded Rail procedures [prescribed by FRA]." *Id.*

The other derailment occurred on May 14, 2005 at Joint Line milepost 76.9 and involved a BNSF train. In its report to the FRA concerning this derailment, BNSF

identified the primary cause of the derailment as a "wide gage" caused by a maintenance/inspection problem – "defective or missing crossties." *See* App. B at 6-7.

2. Human Health is Not an Issue

Experts have long agreed that coal dust emitted from trains poses no "hazard to human health":

> 'Coal dust' is actually an umbrella term for several particle classifications. Coal fines are particles of coal that are 0.5 mm (500 μm) or smaller in diameter. This category can be broken down into many subcategories of increasingly finer particles. Dust smaller than 7-10 μm in diameter is termed respirable dust and is particularly important because these particles are the cause of the emphysemic condition called black lung. This dangerous condition affected a great number of coalminers until the connection was made between respirable dust and black lung emphysema, and preventative measures taken. The problem of respirable coal dust is primarily confined to the underground mining environment. Experts generally agree that the amount of respirable dust generated from coal trains is too small to pose any threat to the health of residents living along the railways (Hogg, 1994). The coal fines which comprise the bulk of fugitive dust emissions from trains are larger than respirable dust.
>
> Coal fines or dust larger than 10 μm have not been linked to negative effects on human health, ecosystems or agricultural activity. Coal dust levels in ambient air arising from rail transport are not considered a hazard to human health (Cope *et al*, 1994). Though dust concentrations in the vicinity of the tracks during the fugitive dust incident can be high, these emission incidents are brief, generally lasting six to ten minutes. Even repeated exposure to high level, short duration dusting from coal trains has not been identified as a hazard to human health.

Jeffrey K. Lazo and Katherine T. McLain, *Community perceptions, environmental impacts, and energy policy*, 24 Energy Policy 531, 534 (1996).

The STB has reached the same conclusions in prior agency proceedings involving coal dust emissions. *See, e.g., Tongue River Railroad Co., Inc. – Constr. and Operation – Western Alignment III – Rosebud and Big Horn Counties, Montana,* STB Finance Docket No. 30186 (Sub-No. 3), Draft Environmental Impact Statement (STB served Oct. 15, 2004) at 149 (STB has repeatedly concluded "coal dust from traveling coal cars" has a "negligible . . . potential impact on airsheds").

3. The Challenged Tariff Items Involve Rail Maintenance Practices and Costs

BNSF has published the Coal Dust Tariff Items because BNSF believes that coal shippers' compliance with these Items will reduce BNSF's current rail maintenance costs. {

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The STB agrees. As the agency has previously held:

> [C]oal dust fouling a railroad's right-of-way is a source of maintenance expenses for railroads. Railroads and coal shippers are exploring ways to reduce the amount of coal dust lost in transit, such as altering the shape of car loads or spraying agents on the coal, thereby reducing the amounts necessary to be spent on maintenance.

Major Issues In Rail Rate Cases, STB Ex Parte No. 657 (Sub-No. 1) (STB served Oct. 30, 2006) at 43 (footnote omitted).

Coal Shippers do not oppose BNSF's, or any other rail carrier's, efforts to reduce their service costs, including their maintenance costs. In fact, PRB coal shippers and producers have cooperated with BNSF extensively in implementing profiling of coal loads and evaluating the efficacy and cost of spraying. However, in implementing programs to reduce its costs, a rail carrier can impose only reasonable burdens on coal shippers. Imposing unreasonable burdens constitutes an unreasonable practice. BNSF's proposed Coal Dust Tariff Items constitute an unreasonable practice because they impose totally arbitrary coal dust mitigation standards and burdens on coal shippers.

B. BNSF's Proposed Coal Dust Tariff Items Are Arbitrary

BNSF's proposed Coal Dust Tariff Items are arbitrary for several inter-related reasons:

1. BNSF's Fixation on Coal Dust is Arbitrary

BNSF is arbitrarily fixated on coal dust. BNSF evidently believes that reducing coal dust emissions will significantly reduce the fouling of the Joint Line and Black Hills Line ballast; that these significant reductions in fouling will require less maintenance of the involved lines (*e.g.*, by reducing the amount of undercutting that needs to be done); and that this reduced maintenance will lead to savings in BNSF's maintenance costs.

However, BNSF's fixation on coal dust arbitrarily ignores the fact that coal dust is one of at least *six* recognized rail ballast contaminants. The others are: naturally occurring dust; breakdown of ballast and concrete ties due to mechanical forces; brake shoe dust; diesel soot; and traction sand.[5] {

}.

Coal Shippers are not aware of any studies prepared by BNSF, or others, demonstrating how limiting the deposition of one contaminant (coal dust) in the ballast will impact the amount of maintenance, and the cost of that maintenance, associated with ameliorating the remaining five contaminants.

One response here is that all one needs to do is to look at pictures of fouled PRB coal ballast and see that most of it is black, and looks like black coal. However,

[5] *See* "Ballast Fouling Initiative on the PRB Joint Line.pdf" (NCTA February 13, 2007); *see also* Viz V.S. at 6-8.

coal dust is like carbon black, a very small amount of it in the ballast will change the color of all ballast contaminants to a shade of black.[6]

Moreover, Coal Shippers are not aware of any scientific testing demonstrating that coal dust is the predominant cause of ballast contamination on the Joint Line or the Black Hills Line. {

[6] {

}

}[7]

In addition to coal dust only being one of the contaminants that may build up in ballast, the amount of the coal dust clearly varies substantially by track segments within the PRB. {

}

It is clearly arbitrary for BNSF to fixate on reducing coal dust in the involved lines ballast without first determining, using sound science, the amount of coal dust that is in the ballast; whether this distribution is uniform; and how much achievable

[7] {

}

reductions in coal dust will realistically reduce the time and costs to address ballast maintenance considering the impact and rate of accumulation of ballast breakdown and other contaminants.

2. BNSF's Fixation on Coal Dust Coming Out of the Tops of Rail Cars Is Arbitrary

The logical source for coal dust in the ballast is coal dropping out of the bottoms of bottom dump coal cars. This is the case because the bottoms of these cars are designed to open and, if not closed correctly, coal fines can come out of the bottom of the cars and fall directly into the right of way.

Despite the obvious causal connections here, BNSF has simply chosen to ignore undertaking any statistically valid studies concerning coal "dust" emissions from the bottoms of bottom-dump cars. {

}[9]

BNSF's fixation on addressing coal dust coming out of the tops of rail cars is arbitrary because BNSF has not first determined, using statistically valid samples, whether the source of coal dust in the rail ballast is coal dropping out of the bottoms of bottom dump cars or coal dust emitted from the tops of rail cars.[10]

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[8] *See Union Pacific R.R. v. Entergy Arkansas, Inc., et al.*, CV2006-2711 (Cir. Ct., Pulaski County, Ark.).

[9] The Arkansas Court granted Entergy's Motion to preclude Dr. Emmitt from testifying as an expert witness in the *UP/Entergy* litigation. *See Union Pacific R.R. v. Entergy Arkansas, Inc.*, Case No. CV 2006-2711(Cir. Ct., Pulaski County, Ark.), Order Concerning Entergy's and the Intervenors' Motion to Exclude the Testimony of Dr. George D. Emmitt, dated March 10, 2008 (granting Entergy's Motion). Mr. Murphy, while deposed in the litigation, was not identified as an expert witness, and accordingly, was not one of the subjects of Entergy's Motion.

[10] {

}

3. BNSF Arbitrarily Assumes That Its E-Samplers Are Measuring Materials Deposited In Track Ballast

BNSF's IDV.2 standards are predicated on data collected in so-called E-Sampler Trackside Monitors ("TSM"). Two TSM's are located at Milepost 90.7 on the Joint Line and two TSM's are located at Milepost 558.2 on the Black Hills Line. The TSM's are set up so one is on the east side of the track and the second is on the west side for the Joint Line location, and for the Black Hills location, one TSM is on the north side of the track and one is on the south side. Also, as particularly pertinent here, the TSM's are located, at a minimum, approximately *60 feet* from the nearest rail line.[11]

Because they are located so far away from BNSF's track, the TSM's are not directly measuring the amount of contaminants (be it coal dust, ambient dust, or other contaminants) that are coming from a train and being deposited in the ballast. Viz V.S. at 5. What the monitors are in fact measuring is air contaminants that are 60+ feet from the track when a train goes by. BNSF simply assumes that dust or other air contaminants captured in the E-Samplers is being deposited on the track.

BNSF's assumptions are particularly arbitrary because, as Dr. Viz explains, there are simple tests that BNSF could use to actually measure the amount of dust or other contaminants that actually move from loaded and empty trains into the ballast. For example, Dr. Viz suggests that the existing "dustfall collectors" that BNSF has used in its testing "could potentially be used for this measurement, but that would involve placing

[11] *See* BNSF Reply to AECC's Petition for Declaratory Order, Exh. A at 3.

them in key locations in test pits in the ballast itself and not 10, 20 or even 80 feet from the tracks as they are currently positioned." *Id.*

4. BNSF Arbitrarily Assumes That Its E-Samplers Are Measuring "Coal Dust"

BNSF uses the data it collected from its E-Samplers to derive a "volume of coal dust." *See* BNSF Tariff 6041-B at Items 100 and 101. However, the E-Samplers are doing no such thing. As Dr. Viz explains, an E-Sampler uses a laser beam to identify the concentration of particles in the air at the sampler location at a specific time. However, the E-Sampler does not and cannot identify what the particles consist of – *e.g.*, they could be coal dust, they could be dirt, they could be bugs, they could be diesel soot; or they could be any other form of airborne particulates. Viz V.S. at 5-6.

BNSF arbitrarily assumes that the E-Samplers are capturing the "volume of coal dust" but in fact the E-Sampler is simply measuring whatever particulates are in the air at the E-Sampler location when a train passes 60+ feet from that location.

5. BNSF Arbitrarily Failed to Follow the Manufacturer's Instructions to Obtain Valid E-Sampler Results

The E-Sampler used by BNSF was designed to capture air emission data using both a laser and a filter to monitor the same emission time intervals. As explained by the E-Sampler manufacturer, using only the laser to measure air emissions is bound to produce incorrect results over time because "[a]ll light scatter devices have inherent difficulties when converting light scatter to mass." *See* E-Sampler Operation Manual (E-Sampler-9800 Rev. G) at 20; *see also* Viz V.S. at 10-12.

For this reason, the E-Sampler contains a 47-mm gravimeter filter system which is used "to compare the light scatter concentration for a set period of time with a gravimetric concentration over the same time period." *Id.* The filter method "is the standard measurement technique in most countries . . . [it] is very accurate and yields repeatable data." E-Sampler Operation Manual at 12.

To obtain accurate measurement results, the E-Sampler manufacturer directs users to utilize both the laser and the filter methods to measure air emissions and to adjust the laser results using what is called a "K Factor" so the results of the laser measurements conform to the results of the filter measurements. Viz. V.S. at 10-12.

BNSF has admitted that it has not followed the manufacturer's instructions for proper use of the E-Sampler. *See* BNSF Response to Coal Shippers' Interrogatory No. 11 ("BNSF states that BNSF and/or SWA have not used a separate filter-based sampler in conjunction with the E-Samplers on the Joint Line and/or the Black Hills Sub-Division for calibration purposes."). This failure was arbitrary, and the all of the data results obtained from the E-Sampler are fatally flawed.

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7. BNSF Arbitrarily Refused to Provide Coal Shippers the Program it Uses to Calculate a Train's IDV

BNSF utilizes a computer program to translate the data from the E-Samplers into an "IDV" value for individual trains. Coal Shippers requested that BNSF provide a copy of this program, but BNSF has refused to provide it.

Without this program, neither Coal Shippers, nor the Board, have any idea of what BNSF is really doing when it takes raw E-Sampler data and translates that data into an "IDV" standard for a particular train. Nor, of course, can Coal Shippers or the Board replicate these procedures. They remain in a giant Black Box.[16]

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BNSF's refusal to produce the program is arbitrary and its failure to do so a blatant violation of the STB's rules of practice. *See, e.g., Texas Mun. Power Agency v. Burlington N. & S. F. Ry.*, STB Docket No. 42056 (STB served March 24, 2003) at 41 (rejecting BNSF study based on computer modeling because "the [study] program was not available to us for our review and manipulation"); *Western Fuels Ass'n, Inc. Burlington N. & S. Ry.*, STB Docket No. 42088 (STB served Sept. 10, 2007) at 37 (same).

BNSF's refusal to open its Black Box is particularly egregious here because BNSF's "IDV" metric is one that BNSF made up; has never been used before in any setting; is not recognized by anyone (other than BNSF) as having any validity whatsoever; and has never been peer reviewed. *See* Viz V.S. at 16-18; BNSF Responses to Coal Shippers' Second Set of Interrogatories and Requests for Production of Documents (Response to Interrogatory No. 8).

8. The Statistical Analysis BNSF Used to Derive the IDV Train Limits Is Fatally Flawed

The Coal Dust Tariff Items set a maximum IDV.2 value for Orin Subdivision trains at "300 units" and "245 units" for Black Hills Line trains. These values were purportedly derived based on a "statistical" analysis prepared by BNSF. According to BNSF, if these maximum IDV.2 levels are adhered to, its IDV emissions on the two rail lines will be reduced by 85%. *See* Andrew V.S. at 2 (citing "2007_coal_conference_ coal_dust_breakout[1].pdf").

BNSF appears to have developed its maximum IDV.2 figures in a regression analysis that uses as input data calculated IDV.2 figures for each evaluated train derived from two or more E-Sampler monitor readings for the same train. Andrew V.S. at 4-5. There are several fatal flaws in BNSF's statistical analysis.

First, BNSF has not validated, using any acceptable statistical measures, that the input data developed from the monitors is producing statistically accurate results. As Dr. Andrew explains:

> The system for validating monitors developed by SWA is not usable and greatly underestimates the risk of identifying a train as contributing to BNSF's coal dust problem when it is not. Without reliable data and proper estimates of variation and a statistically derived decision rule for rejecting a monitor for low precision, the detection system is fatally flawed.

Andrew V.S. at 2.

Second, BNSF's statistical efforts are fatally flawed because BNSF relied upon linear regression methods to develop its IDV.2 maximums. As Dr. Andrew explains, linear regression can only be applied properly when there are no measurement errors in the observation of both values being compared. Here, however, BNSF is comparing two input data values, each of which contains measurement errors. *Id.* at 10. In such circumstances, BNSF's use of a regression methodology is inappropriate and leads to prediction intervals that are incorrect. *Id.* at 11 ("A badly measured variable

contaminates all the least squares estimates. If more than one variable is measured in error, there is very little that can be said.").[17]

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[17] *Id.* (quoting William H. Green, *Econometric Analysis* (5th ed.), Prentice Hall, New Jersey (2003), p. 86).

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C. Compliance With BNSF's Arbitrary Coal Dust Tariff Items Would Place Manifestly Unreasonable Burdens On Coal Shippers

BNSF's arbitrary Coal Dust Tariff Items also should be rejected because they place manifestly unreasonable burdens on coal shippers.

1. Compliance Will Require Shippers to Double Pay or Triple Pay For the Same Maintenance Costs

As discussed in earlier sections of this Argument, railroads have traditionally dealt with coal dust that drops onto roadbed ballast as well as the various other contaminants that build up in the ballast by periodically cleaning the ballast. Such cleaning can include shoulder ballast cleaning, undercutting and vacuuming.

Rail lines over which coal is transported have always experienced some level of coal particles/dust falling onto the roadbed from passing trains. As Mr. McDonald relates, when the Joint Line was developed, it was recognized that this phenomenon would occur and maintenance activities were planned and implemented to address it. Naturally, as train volumes over the Joint Line increased, so also did the amount of coal dust falling on the roadbed, the amount of fines produced by breakdown of ballast, concrete ties, and other contaminants. As a result, more frequent maintenance is in order to keep the ballast in a satisfactory condition. *See* McDonald V.S. at 6.

Accordingly, BNSF has always incurred costs to maintain its PRB coal lines and those costs have naturally increased with increases in coal volumes transported. As BNSF has repeatedly informed the Board in PRB maximum rate cases, these maintenance costs include ballast cleaning and undercutting costs which are designed to

remove the contaminants fouling the ballast, including coal dust. *See Western Fuels Ass'n, Inc. v. BNSF Ry.*, STB Docket No. 42088 (STB served Sept. 10, 2007) at 74-75; *Otter Tail Power Co. v. BNSF Ry.*, STB Docket No. 42071 (STB served Jan. 27, 2006) at C-28.

The rail rates that BNSF charges for transportation of coal out of the PRB are designed to cover all of its costs associated with its services, including the cost of roadway maintenance activities such as undercutting and ballast cleaning. In order to confirm this unremarkable fact, Coal Shippers sought discovery in this proceeding of information concerning BNSF's PRB coal rates and associated costs, which BNSF refused to produce. BNSF counsel did, however, affirm that BNSF sets market-based rates that are designed "generally to cover its variable costs, which would include maintenance costs relating to ballast cleaning, undercutting and shoulder cleaning, and to generate contribution that will assist in covering fixed costs." *See* Crowley V.S., Exh. TDC-2.

As a result, every time a coal shipper attempts to comply with BNSF's Coal Dust Tariff by spraying the coal, or taking any other available compliance efforts, the coal shipper will be paying twice for the same maintenance costs – once through its rates and a second time through its payments for spraying or other compliance efforts. Moreover, as discussed below, to the extent BNSF were to add on penalty payments even if a train is sprayed but still fails the applicable IDV standard, a shipper could end up triple paying for the same costs – once through its rates, a second time through its compliance payments and a third time via penalty payments to BNSF.

It is commercially and legally unreasonable to force coal shippers, at their own expense (or at the expense of their coal suppliers which will eventually increase the shippers' coal purchase prices) to undertake unproven measures in order to attempt to satisfy unsupported standards relying on arbitrary measurement techniques and inadequate technology, all for the purpose of reducing BNSF's track maintenance expenses, for which the coal shippers are already paying for in their rates.

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2. Wholesale Spraying of PRB Coal Trains Makes No Economic Sense

As discussed in previous sections, the railroads generally, and BNSF in particular, have long dealt with coal dust deposited on the rail roadbed through well-established maintenance of way techniques. When such practices are employed on a reasonable schedule, they are effective in maintaining the roadbed in a safe and satisfactory operating condition. In addition, dealing with coal dust through these practices is a more economic manner in which to maintain the roadbed, than requiring the spraying of coal trains with surfactants.

a. The Cost to Coal Shippers of Wholesale Train Spraying are Estimated at Between { }

Coal Shippers' expert witness Thomas D. Crowley of L.E. Peabody & Associates, Inc. has analyzed the cost of spraying for coal dust versus the cost of reliance on the traditional maintenance of way techniques. As he explains in his testimony,

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b. BNSF's Costs for Coal Dust Removal Using Traditional Maintenance Procedures are Estimated at { } Annually

Mr. Crowley's testimony also addresses the costs incurred by BNSF to maintain its lines in the PRB by removing coal dust from ballast through traditional roadway maintenance practices. He notes initially that in addition to coal dust, there are major elements of other contaminants that foul ballast in the PRB. For example, {

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When the costs of spraying coal trains are compared to the cost of addressing coal dust through traditional maintenance techniques, it is clear that it does not make economic sense to spray PRB coal trains in order to suppress dust. In its 1994 regulatory responsibilities study, the ICC described the scope of its unreasonable practices jurisdiction as follows:

> Not only must a carrier's rates be reasonable, but so must its practices. . . .
>
> This statutory requirement derives from the common law common carrier obligation. It is intended to protect against unreasonable carrier actions that impeded interstate commerce. In evaluating carrier practices, '[t]he question is not whether the [questioned practice] can be described as 'rational' from the railroads' perspective, but instead whether the practice . . . is reasonable when viewed from the public perspective of the Commission, which must reconcile a multitude of factors in exercising its expert judgment on tariff issues, including economy, efficiency, fair wages and working conditions, and safety, in addition to the financial considerations of the carriers.'

ICC Regulatory Study, 1994 WL 639996, at *20 (1994) (emphasis added).

Requiring coal shippers to incur the costs of spraying coal trains is inconsistent with economic considerations based on the societal costs of dealing with coal dust, which would be greatly increased over the costs of maintaining clean ballast through traditional maintenance procedures. The FRA criticized the Association of American Railroads for attempting to use the interchange rules in a comparable manner to unilaterally "force" economically advantageous tank car rules on shippers: "[AAR's] Circular 1178 will . . . require huge expenditures by the . . . shippers for only modest actual benefits to the railroads or the public at large." *See Hazardous Materials: Improving the Safety of Railroad Tank Car Transportation of Hazardous Materials* (Notice of Proposed Rulemaking Regulatory Impact Analysis), Docket No. FRA-2006-25169 (PHMSA issued March 19, 2008) at 8.

BNSF, which stands to save significant dollars through reducing its maintenance requirements may be indifferent to the fact that its approach would needlessly cause a major increase in the cost of dealing with coal dust. For the Coal Shippers and their customers, however, the many millions of dollars that would be wasted are a major issue. {

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The reaction of PRB coal shippers and coal producers to BNSF's proposed program for addressing coal dust has been very reasonable given the deficiencies in BNSF's standards and measurement techniques and the economic consequences of its proposal. The effectiveness of dealing with coal dust through traditional practices is well-established. As addressed elsewhere in these Comments, BNSF's standard for an acceptable level of coal dust is unsupported and involves a great deal of uncertainty. BNSF's equipment and procedures for measuring the amount of coal dust falling on the roadbed are also demonstrably deficient in major respects. As a result, BNSF's analyses of the amount of coal dust generated by PRB coal trains and its analyses of the amounts by which coal dust is reduced by different measures, primarily profiling and spraying, are highly suspect and an insufficient basis upon which to establish the challenged Tariff Rules.

In the face of these realities, coal shippers and producers have responded in a very reasonable manner to BNSF's proposed program. In the case of profiling, although BNSF's analyses of the amount of dust and, therefore, the amount of the reduction of dust caused by profiling, are unsupported, coal shippers and producers have cooperated and implemented profiling because the effects appear to be beneficial and the additional cost is relatively modest. With respect to spraying, however, PRB coal shippers and producers have been understandably reluctant to accept BNSF's proposals given the numerous issues relating to: (1) the establishment of BNSF's standards; (2) the adequacy of its measurement techniques; and (3) the effects of such spraying, because the

cost of spraying would be substantial and would be duplicative of costs coal shippers already pay in the rates BNSF charges for coal transportation.

3. There Are No Proven Compliance Methods

At the present time, there are no proven methods to comply with BNSF's IDV.2 standards. Coal shippers and BNSF have looked at various spraying applications but, at this time, Coal Shippers are unaware of any sprays that anyone, be it BNSF, a mine or a spray manufacturer, have certified, or guaranteed will, if applied to a train, ensure compliance with BNSF's IDV.2 standards. *See* Viz V.S. at 18.[22] {

} Thus, BNSF is, in effect, mandating that shippers comply with a standard, but there is no proven way to do so at this time. This clearly places unreasonable burdens on coal shippers. Before any IDV.2 standard is implemented, BNSF must, at a minimum, first devise a proven compliance methodology.

Similarly, there is no proven method now to comply with BNSF's train profiling requirements. All PRB mines have installed profiling devices in their coal loading chutes, but despite this fact, BNSF is now sending notices to many mines and

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utilities informing them that loaded trains are not meeting BNSF's profiling requirements. It is unfair for utilities and mines to use what is now state-of-the art loading technology, and still be deemed to be violating BNSF's profiling requirement. It is incumbent on BNSF, the author of the profiling rule, to devise an approved compliance methodology before any train profiling tariff standard is permitted to take effect.

D. The Challenged Tariffs Cannot be Considered Reasonable Without Knowledge of the Consequences of Violating Their Terms

To date, BNSF has not published or otherwise specified in a public document any enforcement policy or program identifying what the consequences would be if a coal shipper fails to comply with the challenged tariff items. In response to an interrogatory from Coal Shippers seeking information relating to any penalties or consequences that BNSF has considered, discussed or otherwise reviewed, BNSF stated: "no formal non-privileged consideration has been given to specific penalties or consequences relating to trains that fail to comply with Items 100 and 101 of BNSF's Price List 6041-B, no decisions have been made regarding such penalties or consequences, and no actions have been taken to enforce compliance with Items 100 or 101 of BNSF's Price List 6041-B."[23] Coal Shippers are not aware of any documents that have been produced by BNSF in discovery that specify penalties or consequences for violating Items 100 or 101 of BNSF's Price List 6041-B. Although it seems highly likely

[23] *See* BNSF's Responses and Objections to Coal Shippers' First Set of Interrogatories and Document Production Requests, dated January 8, 2010, at 6.

that there must be documents discussing enforcement policies, care must have been taken to craft such documents to qualify for protection against discovery based on privilege.

Without knowledge of the consequences of violating the challenged tariff items, the Board cannot make a reasoned decision concerning their reasonableness. Even if the Board were to conclude that the challenged tariff items do not constitute an unreasonable practice based upon the many other reasons discussed in these Comments, the Board must consider what the enforcement mechanism will be before reaching a decision that would allow BNSF to implement these tariff items.

Obviously, the practical impact of the tariff items will be largely defined by the enforcement mechanism. If there is no enforcement, Coal Shippers and others may reasonably decide, for all the reasons discussed in these Comments, not to comply with the items. If the enforcement mechanism for a train emitting more than the maximum IDV.2 level, as measured by BNSF is denial of service[24] in any form (*e.g.*, refusing to transport all trains that the owner/lessor of such train has in PRB service), it might be effective in achieving compliance, but there could be no serious question that the items are unreasonable.

Nor should the Board be persuaded by any suggestion that BNSF should be allowed to implement the challenged items and to define enforcement policy after the fact

[24] There have been published reports of comments by senior BNSF officials that both fines and denial of service may be imposed as penalties: "A top BNSF official told utility customers this month that penalties for not meeting dust standards include a $1 per ton fine and possibly temporarily halting service." *See* Platt's Coal Trader, "UP Letter Mulls Implications of Coal Dust Rules," October 19, 2009. At $1 per ton, fines per train would exceed $14,000 for many trains.

based upon experience. The likely effect of such an approach would be to force coal producers/shippers to incur the major costs associated with installation throughout the PRB of the infrastructure necessary to spray coal trains as they are loaded. Reasoned and responsible exercise of the Board's jurisdiction in this matter should not condone such a result. This is particularly true since there is no compelling reason why BNSF cannot define its enforcement mechanism now so that the Board can make a decision with the benefit of being informed as to all the critical elements of the program BNSF seeks to implement. Principles of judicial economy discourage the sort of piecemeal litigation that would otherwise result. *See, e.g., St. Louis S.W. Ry. Arbitration Appeal,* ICC Finance Docket No. 28799 (Sub-No. 9), 1995 WL 479439 (ICC served Aug. 15, 1995), at *4 ("[J]udicial doctrines to prevent . . . piecemeal litigation . . . serve the dual purpose of protecting a litigant from the burden of retaliation and of promoting judicial economy.").

III.

BNSF MUST REIMBURSE COAL SHIPPERS FOR THE REASONABLE COSTS THEY INCUR IN COMPLYING WITH THE COAL DUST TARIFF ITEMS

For the reasons set forth above, Coal Shippers' request that the Board find BNSF's proposed imposition of the Coal Dust Tariff Items constitutes an unreasonable practice. If the Board does not so hold, Coal Shippers alternatively request that the Board direct BNSF (and UP if it attempts to enforce the Coal Dust Tariff Items) to pay affected coal shippers an allowance equal to the reasonable costs the shippers incur in attempting to meet the profiling and IDV.2 standards.

The common carrier obligation requires that a rail carrier shall provide "transportation or service on reasonable request." 49 U.S.C. § 11101(a). To fulfill this obligation, a carrier must maintain its lines in good working order and repair.[25] The obligation to do so rests with the carrier,[26] not the shipper, and if a carrier believes that coal dust rules are necessary to properly maintain its lines, the duty to comply with these rules rests with the carrier, not the shipper. *See Railroad Ventures, Inc. – Abandonment Exemption – Between Youngstown OH, and Darlington, PA*, STB Docket No. AB-556 (Sub-2X) (STB served April 28, 2008) at 10 ("a common carrier [has] a duty to maintain its rail line in accordance with [governing] rules and regulations").

A basic corollary to the common carrier obligation is that if a carrier requires that a shipper perform transportation services, the Board may order the carrier to establish a reasonable allowance. *See* 49 U.S.C. § 10745 (Board can prescribe maximum allowance where a shipper "directly or indirectly, furnishes a service related to . . . the transportation"); *Bud Antle, Inc. v. United States,* 593 F.2d 865, 873 (9th Cir. 1979) (carrier must pay an allowance "if a shipper permissibly performs services the carrier is bound to render").

The Board should direct BNSF to pay affected coal shippers an allowance equal to the reasonable costs coal shippers incur in their efforts to comply with the Coal Dust Tariff Items because compliance with these Items requires coal shippers to "perform

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[25] *See, e.g.*, 49 C.F.R. § 213 (setting forth minimum track maintenance standards enforced by the FRA).

[26] *See, e.g., id.* at § 213.5 (track owner is responsible for maintaining the track).

services the carrier is bound to render" – *i.e.*, to take actions to comply with the carrier's track maintenance rules through train profiling, train spraying or other means. The reasonable costs coal shippers incur to provide these services must be returned to them in the form of a reasonable allowance.

At this time, how much it will cost a shipper to comply with the Coal Dust Tariff Items (assuming compliance can be achieved at all) is not known. Coal Shippers request that the Board direct BNSF to publish a coal dust allowance tariff containing a schedule of reasonable sums that BNSF will pay coal shippers for actions taken by these shippers to comply with the Coal Dust Tariff Items. Coal Shippers also request that the Board reserve jurisdiction to address the reasonableness of the allowance schedule upon complaint by an affected coal shipper or shippers.

IV.

BNSF MAY NOT DENY SERVICE FOR FAILURE TO COMPLY WITH THE CHALLENGED TARIFF ITEMS

As a common carrier, BNSF is obligated to provide service to rail shippers upon reasonable request. 49 U.S.C. § 11101 (a). The service provided must be adequate to meet the shipper's needs. The requirement that service be adequate is "a part of the general definition of common carrier obligations." *Granite State Concrete Co. v. STB*, 417 F.3d 85, 92 n.10 (1st Cir. 2005) (citing *Nat'l Grain and Feed Ass'n v. United States*, 5 F.3d 306, 311 (8th Cir. 1993) and *Wales Transp., Inc. v. ICC*, 728 F.2d 774, 780 n.9 (5th Cir. 1984)).

It is clear that economic considerations are at the heart of BNSF's efforts to force coal shippers to reduce coal dust. There can be no serious question that BNSF is capable of maintaining its roadbed in the PRB in a safe and adequate condition utilizing traditional maintenance of way techniques. As discussed in Section I above, this is not a safety matter. If a train exceeds the maximum IDV.2 standards that BNSF has set in the Coal Dust Tariff Items, the roadbed will not be rendered unsafe for the movement of traffic over BNSF's lines. Nor will additional trains failing the standard have that effect. Since the May 2005 derailments (which were caused by extensive deferred maintenance), there have been no further derailments which have been claimed to be caused by coal dust. Obviously, except for limited tests, coal trains have not been sprayed during the intervening years.

Relevant case law rejects the notion that carriers may rely on economic considerations in determining whether to comply with their common carrier service obligations. *See, e.g., Ethan Allen, Inc. v. Maine Central R.R.*, 431 F. Supp. 740, 743 (D. Vt. 1977) ("A railroad may not, for example, justify a refusal to provide service solely on the grounds that to continue to provide service would be inconvenient or less profitable."); *General Foods Corp. v. Baker*, 451 F. Supp. 873, 875 (D. Md. 1978) (railroads may not, "on their own authority, refuse to maintain service when it becomes inconvenient to do so or because profits are declining").

In one case regarding the impropriety of basing service decisions on economic considerations, *Pejepscot Industrial Park, Inc., d/b/a Grimmel Industries – Petition for Declaratory Order*, STB Finance Docket No. 33989 (STB served May 15,

2003), the Board emphatically rejected the suggestion that a carrier could rely upon profitability levels to decide for itself whether it must comply with its common carrier obligation:

> Respondents cannot lawfully make fulfilling their statutory obligations contingent upon whether they think it is "worth it" to do so. Rather, a carrier must adhere to its statutory obligations even if it suffers hardship in so doing. *See, e.g., Decatur County Comm'rs v. Surface Transp. Bd.*, 308 F.3d 710, 715 (7th Cir. 2002) ("[railroads] may not refuse to provide service merely because to do so would be inconvenient or unprofitable") (citing *G.S. Roofing Prods. Co. v. Surface Transp. Bd.*, 143 F.3d 387, 391 (8th Cir. 1998)); *Classification Ratings on Chemicals, Conrail*, 3 I.C.C.2d 331, 337-38 (1986) (Classification Ratings) (railroads may not avoid their obligation to provide rates or service because the commodities in question are hazardous and, if not handled safely, could potentially expose the carriers to substantial financial liability).

Id. at 12-13 (emphasis added).

In a situation where coal trains are exceeding the BNSF's maximum IDV.2 standards, the only possible adverse effects (assuming for the moment, contrary to fact, that the measurement methodology and standard were scientifically valid) would be additional dust on the roadbed which might, if allowed to continue over a long period of time, require more frequent ballast cleaning. In other words, there would be no short term impacts that could possibly warrant a refusal to continue to operate the offending train(s) or other trains in service for the same owner/lessor.

The rail movement of coal is of critical importance to the nation's economy. Coal serves as the most prevalent fuel for electricity generation and its reliable delivery from coal mines to power plants is vital to the integrity of the electric system.

Indeed, the Board acknowledged at the outset of this proceeding "the vital role transportation of coal by rail plays in the nation's energy supply and the economy in general." *December '09 Decision* at 1. There can be no justification for refusing to provide coal transportation service on the basis of non-compliance with BNSF's challenged tariff items.

CONCLUSION

Coal Shippers request that the Board issue declaratory relief in the manner set forth above.

Respectfully submitted,

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Dated: March 16, 2010

CERTIFICATE OF SERVICE

I hereby certify that this 16th day of March, 2010, I have caused the forgoing to be served via first-class mail, postage prepaid upon counsel for BNSF Railway Company and the Arkansas Electric Cooperative Corporation. I further certify that this 16th day of March, 2010, I have caused redacted, public copies of the forgoing to be served via first-class mail, postage prepaid upon the parties of record to this case.

Andrew B. Kolesar III

APPENDIX A

IDENTITY AND INTERST OF THE CONCERNED CAPTIVE COAL SHIPPERS

(1) American Electric Power Service Corporation. AEP Service Corporation acts as agent for its American Electric Power ("AEP") electric generating affiliates in securing coal transportation services by rail for more than 44 million tons of coal annually. AEP, with more than 5 million American customers, is one of the country's largest investor-owned utilities, serving parts of 11 states. The service territory covers 197,500 square miles in Arkansas, Indiana, Kentucky, Louisiana, Michigan, Ohio, Oklahoma, Tennessee, Texas, Virginia and West Virginia. AEP owns and operates 62 generating stations in the United States, with a capacity of more than 38,000 megawatts. Coal fired plants account for 73 percent of AEP's generating capacity.

(2) Consumers Energy Company. Consumers Energy is a combined electric and natural gas utility that is authorized to provide service in all of the 68 counties of Michigan's Lower Peninsula. Principal cities located within Consumers Energy's electric utility operations include Battle Creek, Bay City, Cadillac, Flint, Grand Rapids, Jackson, Kalamazoo, Midland, Muskegon and Saginaw. Consumers' electric utility customer base includes a mix of residential, commercial and diversified industrial customers, the largest segment of which is the automotive industry.

The largest share of Consumers' electricity requirements is satisfied by five coal-fired generating plants: the J.H. Campbell Station near West Olive, MI; the D.E. Karn and J.C. Weadock Stations near Essexville, MI; the B.C. Cobb Station at

Muskegon; and the J.R. Whiting Station near Toledo, Ohio. Together, these facilities have a capacity of 2,850 megawatts and produce approximately 17.3 million megawatt hours of electricity each year through the combustion of over 9 million tons of coal. These plants comprise over 78% of Consumers' baseload system capacity. The Campbell and Whiting Stations are each captive to a single carrier for coal deliveries (i.e., CSX Transportation, Inc. and Canadian National, respectively).

(3) Dairyland Power Cooperative. Dairyland Power Cooperative. Dairyland Power Cooperative, which is headquartered in La Crosse, Wisconsin, is a generation and transmission cooperative (G&T) that provides the wholesale electrical requirements and other services for 25 electric distribution cooperatives and 16 municipal utilities in the Upper Midwest. Dairyland delivers electricity via more than 3,100 miles of transmission lines and nearly 300 substations located throughout the system's 44,500 square mile service area, which encompasses 62 counties in four states (Wisconsin, Minnesota, Iowa and Illinois).

Dairyland's coal-fired generating stations include the 400-MW J.P. Madgett Station, the 379-MW Genoa Station #3, and the 210-MW Alma Station. Dairyland's coal-fired units consume more than 2 million tons of coal annually. These units are located in western Wisconsin and their coal requirements must be transported over substantial distances.

(4) Dynegy, Inc. Dynegy, Inc. ("Dynegy") and its operating subsidiaries produce and sell electric energy, capacity and ancillary services in key U.S. markets. The company's power generation portfolio consists of approximately 12,500

megawatts of baseload, intermediate and peaking power plants fueled by a mix of coal, fuel oil and natural gas. Dynegy affiliates operate a number of existing coal-fired power plants that are served by rail and that use Powder River Basin coal, and Dynegy thus has a substantial interest in this proceeding as it relates to future rail rates and service to these power plants.

(5) Entergy Arkansas, Inc., Entergy Gulf States Louisiana, L.L.C., Entergy Services, Inc. Entergy Services, Inc. is a wholly owned subsidiary of Entergy Corporation and acts as agent for the various Entergy electric utility operating subsidiaries (including Entergy Arkansas, Inc. ("EAI") and Entergy Gulf States Louisiana, L.L.C. ("EGSL")) with respect to the acquisition and transportation of coal. EAI co-owns four coal-fired generating units located at two electric generating stations in Arkansas, which are known as White Bluff and Independence. EGSL owns one coal-fired generating station in Southwest Louisiana, which is known as Roy. S. Nelson, and owns 42% of the Big Cajun II, Unit 3 coal generating station in New Roads, Louisiana. The six coal-fired generating units located in Arkansas and Louisiana have a total generating capacity of more than 4,000 MW. All of these units were designed to burn 100 percent PRB coal.

All of the coal units are served directly by railroad and have historically received virtually all of the coal that they burn via railroad. Entergy Services coordinates the transportation of approximately 15 million tons of coal per year to Entergy's various generating stations via Union Pacific Railroad Company and BNSF Railway Company.

(6) Intermountain Power Project. Intermountain Power Agency ("IPA"), a political subdivision of the State of Utah, is the owner of the Intermountain Power Project ("IPP"). IPP is located in the great basin of western Utah near Lynndyl, Millard County, Utah. The project generates more than 13 million megawatt hours of energy each year from its two coal-fired units and serves approximately 2 million customers. The units have a total capacity of 1,900 MW Gross and consume over 6 million tons of coal per year.

IPP's generation rights are held, respectively, by the Los Angeles Department of Water and Power (44.6%), five California cities (30%), twenty-three municipal Utah purchasers (14%), six cooperative Utah purchasers (7%), and one investor-owned Utah purchaser (4%).

IPP's generating station is served only by the Union Pacific Railroad Company.

(7) Progress Energy, Inc. Progress Energy, headquartered in Raleigh, N.C., is a Fortune 250 diversified energy company with more than 22,000 megawatts of generation capacity and $10 billion in annual revenues. The company's holdings include two electric utilities serving approximately 3.1 million customers in North Carolina, South Carolina and Florida.

Progress Energy's coal-fired plants include: (i) the two unit, 376 MW Asheville Steam Plant at Skyland, N.C.; (ii) the two-unit, 316 MW Cape Fear Plant near Moncure, N.C.; (iii) the four unit 2311 MW Crystal River steam complex, located near Crystal River, Fla; (iv) the three unit, 397 MW H.F. Lee Plant near Goldsboro, N.C.; (v)

the single unit, 742 MW Mayo Plant near Roxboro, N.C.; (vi) the single unit, 174 MW H.B. Robinson Steam Plant near Hartsville, S.C.; (vii) the four unit, 2,424 MW Roxboro Steam Plant near Roxboro, N.C.; (viii) the three unit, 600 MW L.V. Sutton Steam Plant near Wilmington, N.C.; and (ix) the three unit, 172 MW W.H. Weatherspoon Steam Plant near Lumberton, N.C. All of Progress Energy's coal-fired plants are served by rail. Three are served solely by NS, three solely by CSXT, two jointly by NS and CSXT and one by a CSXT/FNOR path.

(8) Seminole Electric Cooperative, Inc. Headquartered in Tampa, Florida, Seminole Electric Cooperative, Inc. is one of the largest non-profit generation and transmission (G&T) cooperatives in the United States. As a G&T, Seminole generates, sells and transmits bulk supplies of wholesale electricity primarily to its ten member distribution cooperatives. The Members, in turn, provide retail electric distribution services to residential, commercial and industrial consumers. Seminole and its Members serve more than 900,000 metered residential and business consumers (as of the end of 2009) in 45 of Florida's 67 counties. In 2009, Seminole generated annual revenue of more than $1.3 billion. In 2009, more than 99% of Seminole's total operating revenues were generated from sales to its Members and approximately 70% of its Members' total retail sales were to residential consumers. In 2009, Seminole sold more than 17 billion kilowatt hours (kWh) of energy, 99% of which was comprised of energy sales to Seminole's Members. Seminole's aggregate coincident peak demand for the summer of 2009 and the winter of 2009/2010 were 3,738 MW and 4,942 MW, respectively.

The primary energy resource serving Seminole's member systems is the Seminole Generating Station. This 1,300 megawatt, coal-fueled power station is located in Northeast Florida in Putnam County, on the St. Johns River, south of Jacksonville. It consumes approximately four million tons of coal and/or petroleum coke per year. The Seminole Station is served exclusively by CSXT.

(9) South Carolina Public Service Authority (Santee Cooper). South Carolina Public Service Authority (Santee Cooper). Santee Cooper serves over 162,000 retail customers in Berkeley, Georgetown, and Horry Counties, South Carolina, and supplies power to the municipalities of Bamberg and Georgetown, 32 large industries, and one military installation in North Charleston. The state-owned electric and water utility generates the power distributed by the state's 20 electric cooperatives. Santee Cooper power now flows in all 46 counties in the state serving over 625,000 customers.

Santee Cooper owns and operates four large-scale, coal-fired generating stations in South Carolina: Jefferies Station in Moncks Corner, Cross Station in Cross, Winyah Station in Georgetown, and Grainger Station in Conway. All of these plants are served exclusively by CSXT, with the exception of Grainger which is served by a short line carrier from Mullins, SC to Conway. Collectively, these four stations consume approximately 9.4 million tons of coal per year with a capacity of approximately 3,951 MW.

(10) South Mississippi Electric Power Association ("SMEPA"). SMEPA is a rural electric power association formed for the purposes of generating and transmitting electric energy. SMEPA is headquartered in Hattiesburg, Mississippi, and

provides wholesale electric energy to eleven member-owners. The member-owners, in turn, are each rural electric distribution cooperatives who sell power through more than 400,000 meters to homes, farms, and businesses in 56 of the 82 counties in Mississippi. SMEPA recovers its cost of providing electric energy through wholesale rates to its eleven members. Fuel costs, including the costs to transport fuel, are eventually passed on to the electric customers by the local cooperatives.

SMEPA owns and operates an electric generating facility at Richburg, Mississippi known as the Morrow Station. This 400 MW facility consists of two coal-burning electric generating units. The Morrow Station consumes 800,000 to 1,000,000 tons of coal per year, and operates on a nearly continuous basis. Rail transportation is the only economical means of delivering large volumes of coal to the Morrow Station, and rail access to the Morrow Station is exclusively over the lines of NS. As such, SMEPA is captive to NS, and SMEPA has no other current transportation option for delivering its coal purchases. NS currently provides transportation service to SMEPA pursuant to a contract.

APPENDIX B

THE REAL CAUSES OF THE DERAILMENTS

BNSF has stated that its coal dust emission standards "were issued by BNSF after extensive study and are designed to ensure the safety and efficiency of coal train operations and the reliability of service." BNSF Reply in Opposition to AECC Petition for Stay at 1. UP, for its part, has stated that "given the pernicious characteristics of coal dust in the track bed and increasing evidence of deposition beyond the Joint Line, Union Pacific believes that preventing coal dust emissions is both necessary and appropriate." UP Petition to Intervene at 3. Implicit in these comments by both Railroads is the erroneous suggestion that there is something "unsafe" or "inefficient" in loading coal into railcars and transporting those railcars in the same manner they have been loaded and transported for over 100 years in this country.

The Railroads' own records, however, {

}.

I. BNSF and UP's Post-Derailment Documents Reflect That the 2005 Derailments {

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}[2]

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[1] {

}

[2] {

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}

B. UP Post-Derailment Analysis

BNSF was not the only Joint Line owner that had {

June 13, 2005 letter from Richard Davidson to Matthew K. Rose at 1, 2, UP-AECCBN-001493-1497 (emphasis added). The words of Mr. Davidson's letter were carefully vetted. In addition to Mr. Davidson, ***eighteen*** UP officers, employees and lawyers had input and/or reviewed drafts of the letter. (Objections and Responses to Entergy's Third Set of Interrogatories and Requests for Production, Response to Interrogatory No. 3, *Union Pacific Railroad Company v. Entergy Arkansas, Inc., et al.*, CV2006-2711 (Cir. Ct., Pulaski County., Ark.)). These individuals included, among others, UP's President and Chief Financial Officer (James Young), UP's highest ranking operating officer (Dennis Duffy), UP's highest ranking engineer (William Wimmer), UP's highest ranking marketing officer (Jack Koraleski), UP's highest ranking member of its Energy Business unit (Douglas Glass), UP's General Counsel (Michael Hemmer), and another high level in-house attorney (Lou Anne Rinn). *Id.*

II. FRA Records Reflect the Derailments Were Caused by Poor Inspection and Maintenance Practices

A. The FRA's Post-Derailment Records

The FRA's post-derailment records relating to the two May 2005 derailments attributed the causes of the derailments to maintenance-related issues, rather than coal dust or weather events:

- The FRA's May 14, 2005 Rail Equipment Accident/Incident Report submitted by BNSF, a copy of which is included in the electronic workpapers at FRA REPORTS, reached the following conclusions relating to the May 14, 2005 derailment at MP76.9:

- The "primary cause" cited was "T110," which is listed as "Wide Gage (due to defective or missing crossties)" in the FRA's Train Accident Cause Codes.

- The FRA also cited a "contributing cause" of "T103," which is listed as "Deviation from uniform top of rail profile" in the FRA's Train Accident Cause Codes.

- The FRA's May 15, 2005 Railroad Accident Report, a copy of which is included in the electronic workpapers at FRA REPORTS, concluded that the May 15, 2005 derailment at MP63.3 was caused by a defective field weld and poor inspection and follow-up procedures:

  - "The probable cause of the accident was a broken rail: a bolt hole crack in the outermost bolt hole that ran 11 inches to the adjoining field weld, then broke upward through the ball of the rail."

  - "Investigation revealed that the four hole joint at the point of derailment had developed a crack extending from the outermost bolt hole which ran 11 inches to a field weld and then upward through the heat transfer area of the field weld and on through the ball of the rail."

  - "This rail was last tested ultrasonically for internal defects on April 14, 2005 by Herzog Services, Inc. Test Car No. HRZ117. A rail defect was noted at the point of derailment. On that date the carrier installed a temporary repair which consisted of a replacement rail with 6 hole joint bars. The outermost holes were not drilled in the rail for the temporary repair. No record indicated when the rail was permanently field welded."

  - "FRA has recommended prosecution of BNSF for civil penalties for failure to comply with the Continuous Welded Rail ("CWR") procedures: not noting required information on the web of the rail as required."

  - "The BNSF track inspector had inspected this area on May 12, 2005, and noted no defects in the derailment area."

Significantly, neither of these post-derailment documents makes any mention of coal dust or the weather events that BNSF and UP cite as the causes of the May 2005 derailments.

B. The FRA Was Aware that BNSF had Failed to Properly Maintain the Joint Line Ballast.

Review of FRA inspection reports for the pre-derailment period confirms the conclusions BNSF and UP reached in their post-derailment analyses concerning deplorable lack of adequate maintenance on the Joint Line. These poor maintenance practices can be readily illustrated by several examples from the FRA citations.

For example, on July 10, 2003, the FRA inspector noted four specific occurrences of fouled ballast on a section of the Joint Line between MP42.94 and MP61.70, and 25 other conditions out of compliance. The inspector's notes specifically indicated that fouled ballast and mud were present in the 21 switches walked and that "[f]ouled ballast, mud, frog defects and guard check are areas of concern." July 10, 2003 FRA Report, UP-AECCBN-001914-1921.

A month later, on August 13, 2003, the same inspector found seven (7) occurrences of fouled ballast on a section of the Joint Line between MP102 and MP62 (which would include the locations of both of the May 2005 derailments), and another nine (9) out of compliance conditions for other problems. August 13, 2003 FRA Report, UP-AECCBN-001931-1935. The report also recommended a violation for improper gage of the track in a switch. UP 1933. The inspector also specifically noted that "fouled

ballast and coal dust [are] contributing to poor surface conditions" on Main Track No. 1. *Id.* Furthermore, the inspector also noted that "guard check gage remains an area of concern as well as fouled ballast and excessive coal dust." UP-AECCBN-001935.

Almost a year later, the same inspector found five (5) locations between MP127.20 and MP62.40 with fouled ballast, including at MP75.20 (near the location of the May 14, 2005 derailment) and MP63.44 (near the location of the May 15, 2005 derailment). June 9, 2004 FRA Report, UP-AECCBN-001936-1939. In addition to identifying the five specific locations of fouled ballast, the inspector's notes expressly stated that "fouled ballast noted in many locations." UP-AECCBN-001938. To further illustrate the extensive issues that were identified by the FRA in the pre-derailment period, the Coal Shippers offer the following summary chart of FRA violations[3]:

[3] To the extent these reports were included in the UP production citations to the production are included. The reports that are not referenced to the UP production were obtained from the FRA and are included in the electronic workpapers at "FRA REPORTS."

LIST OF MAJOR CONDITIONS FOUND BY FRA INSPECTIONS ON THE ORIN SUBDIVISION BETWEEN JAN. 2004 AND MAY 2005.

Date/Doc. ID	Inspection Area	Unit Type	MP Start	CFR	Condition	Expanded Description from Inspection Report
3/23/2004	Turnouts Main Track	Main Track	17.80	213-0143-01	Guard Check Gage Less Than Allowable	
3/24/2004	Hi-Rail Main Track	Main Track	39.30	213-0109-03	Crossties Not Effectively Distributed to Support a 39-foot Segment of Track	
3/24/2004	Hi-Rail Main Track	Main Track	47.20	213-0121-03	Center cracked or broken joint bar	
3/24/2004	Hi-Rail Main Track	Main Track	52.40	213-0121-07	Less than 2 bolts per rail at any joint in continuous welded rail	
3/25/2004	Walk Main Track	Main Track	58.20	213-0103-02	Fouled ballast	
3/25/2004	Turnouts Main Track	Main Track	58.08	213-0143-01	Guard Check Gage Less Than Allowable	
3/25/2004	Turnouts Main Track	Main Track	52.54	213-0113-04	Vertical Split Head	
3/25/2004	Turnouts Main Track	Main Track	49.50	213-0137-99	Severe frog condition not otherwise provided	
3/25/2004	Turnouts Main Track	Main Track	47.35	213-0103-02	Fouled ballast	
3/25/2004	Turnouts Main Track	Main Track	43.57	213-0103-02	Fouled ballast	
4/7/2004	Hi-Rail Main Track	Main Track	126.20	213-0121-07	Less than 2 bolts per rail at any joint in continuous welded rail	

6/9/20040 UP-AECCBN-001936	Hi-Rail Main Track	Main Track	93.20	213-0103-02	Fouled ballast	
6/9/2004 UP-AECCBN-001937	Hi-Rail Main Track	Main Track	75.20	213-0103-02	Fouled ballast	
6/9/2004 UP-AECCBN-001937	Hi-Rail Main Track	Main Track	65.34	213-0103-02	Fouled ballast	
6/9/2004 UP-AECCBN-001938	Hi-Rail Main Track	Main Track	63.44	213-0103-02	Fouled ballast	
6/9/2004 UP-AECCBN-001938	Hi-Rail Main Track	Main Track	62.40	213-0103-02	Fouled ballast	
6/10/2004	Turnouts Main Track	Main Track	62.10	213-0103-02	Fouled ballast	
6/10/2004	Turnouts Main Track	Main Track	62.12	213-0053-02	Gage dimension is less than allowable on tangent track	
6/10/2004	Turnouts Main Track	Main Track	62.29	213-0103-02	Fouled ballast	
6/10/2004	Turnouts Main Track	Main Track	62.27	213-0103-02	Fouled ballast	
6/10/2004	Turnouts Main Track	Main Track	62.40	213-0103-02	Fouled ballast	
5/4/2005 UP-AECCBN-001947	Walk Main Track	Main Track	69.59	213-0063-08	Difference in crosslevel between any two point less than 62-feet apart on curve	Difference in crosslevel between any two points less than 62-feet apart on curves between spirals exceeds allowable. Inspection conducted as a follow-up on ATIP survey. Static warp measurements equaled total value of 3 1/2 inches at 59 feet. Photographs taken.

5/4/2005 UP-AECCBN-001947	Walk Main Track	Main Track	69.61	213-0063-09	Difference in crosslevel between any two point less than 62-feet apart on spiral	Difference in crosslevel between any two points less than 62-feet apart on spirals exceeds allowable. Inspection was conducted as a follow-up on ATIP survey. Static warp measurements equaled total value of 2 1/4 inches at 61 feet.
5/4/2005 UP-AECCBN-001948	Walk Main Track	Main Track	28.20	213-0063-07	Difference in crosslevel between any two point less than 62-feet apart on tangent	Difference in crosslevel between any two points less than 62-feet apart on tangents exceeds allowable. Inspection was conducted as a follow-up on ATIP survey. Under load warp measurements equaled total value of 1 7/8 inches at 42 feet. Warp was noted and documented on ATIP survey conducted on May 02, 2005. Authorized speed on Main 1 at this location on May 4, 2005 was 50 MPH.
5/4/2005 UP-AECCBN-001948	Walk Main Track	Main Track	28.21	213-0063-05	Deviation from zero crosslevel at any point on tangent exceeds allowable	Deviation from zero crosslevel at any point on tangent exceeds allowable static measurement of 1 3/8 inch. Total underload measurement of 1 3/4. Photographs taken of underload measurements. Crosslevel was noted and documented on ATIP survey conducted on May 02, 2005. Authorized speed on Main 1 at this location on May 4, 2005 was 50 MPH.

5/4/2005 UP-AECCBN-001948	Walk Main Track	Main Track	7.22	213-0063-02	Deviation from uniform profile on either rail exceeds allowable	Deviation from uniform profile on either rail exceeds allowable. North rail static measurement of 2 3/4 inch. Underload measurement between base of rail and load bearing surface of tie plate of 1/4 inch. Total measurement of 3 inches. Photographs taken of measurements. North rail profile was noted and documented on ATIP survey as right rail profile. ATIP survey conducted on May 02, 2005. Authorized speed on Main 1 at this location on May 4, 2005 was 35 MPH. Photographs taken.
5/17/2005 UP-AECCBN-001949	Walk Main Track	Main Track	67.30	213-0063-08	Difference in crosslevel between any two point less than 62-feet apart on curve	Difference in crosslevel between any two points less than 62-feet apart on curves between spirals exceeds allowable
5/17/2005 UP-AECCBN-001949	Walk Main Track	Main Track	67.60	213-0063-08	Difference in crosslevel between any two point less than 62-feet apart on curve	Difference in crosslevel between any two points less than 62-feet apart on curves between spirals exceeds allowable
5/17/2005 UP-AECCBN-001949	Walk Main Track	Main Track	75.20	213-0109-04	Fewer than minimum allowable number of non-defective ties per 39 feet for tangent	Fewer than minimum allowable number of non-defective ties per 39 feet for tangent and curved track less than 2 degrees
5/17/2005 UP-AECCBN-001950	Walk Main Track	Main Track	63.30	213-0119-02	Failure to comply with written CWR procedures	Failure to comply with written CWR procedures. (No nomenclature of field weld, date of weld, who made weld, match marks, temperature, etc.)

In addition to the FRA track inspection reports, the FRA also prepared Track Geometry Inspection Reports dated May 2 and 4, 2005. Track Geometry Reports, UP-AECCBN-001852-1900. These FRA Reports identified numerous areas of concern on

the Joint Line, including several issues with cross-level near the site of the derailments (UP-AECCBN-001853, 1891). In addition, these Reports list many instances of cross-level, warping, and twist exceptions for the areas studied. Copies of the FRA Track Geometry Reports are included in the electronic workpapers.[4]

[4] The UP production copies, however were designated "Confidential" under the governing Protective Order. The copies included in the workpapers were obtained directly from the FRA.

STB FINANCE DOCKET NO. 35305

VERIFIED STATEMENT OF RICHARD H. McDONALD

I. Background and Qualifications

My name is Richard H. McDonald. I am president of RHM Consulting, Inc., a consulting firm specializing in railroad engineering and transportation matters. My office address is 516 W. Shady Lane, Barrington, Illinois.

I graduated from the University of Illinois, College of Engineering with a Bachelor of Science degree in Engineering in 1957. I have also completed the following certificate programs: Railroad Engineering, University of Illinois, 1975; Management for Engineers, University of Iowa, 1976; Accounting for the Non-Accounting Executive, Wharton School, University of Pennsylvania, 1977; and Railroad Profit Strategy, Kellogg Center, Northwestern University, 1990. I have been an active member of the American Railway Engineering Association (the predecessor of the current American Railway Engineering & maintenance-of-Way Association, or AREMA) and the Chicago Maintenance of Way Club.

I have over 40 years of experience in the railroad engineering and operations fields, primarily at the former Chicago and North Western Railway ("CNW") which is now part of the Union Pacific ("UP") system. I began my railroad career in 1958 at the New York Central Railroad, where I held positions as Assistant Engineer, Roadmaster and Division Engineer (for both New York Central and Penn Central). In

1974 I left Penn Central and joined CNW, where I held several positions of increasing responsibility in the Engineering and Operating Departments including Assistant Division Manager-Engineering and later Division Manager at St. Paul, MN; Vice President–WRPI; Vice President–Operating Administration; Vice President–Engineering, Vice President–Transportation, Vice President–Operations, and Vice President–Planning & Acquisitions.

As Vice President–WRPI from 1981 to 1984, I was responsible for all facets of CNW's project to construct more than 100 miles of new railroad lines and associated facilities necessary to enable CNW to serve the Powder River Basin ("PRB") mines reached via the so-called Joint Line, which is part of what is now BNSF Railway Company's ("BNSF") Orin Subdivision. I was also responsible for implementing both the operating plan and the maintenance-of-way plan for Western Railroad Properties, Incorporated ("WRPI"), which was the CNW subsidiary on whose behalf CNW constructed the PRB lines and operated them from the completion of initial construction in mid-1984 until CNW's acquisition by UP in 1995. Subsequently, I was responsible for the interface between CNW/WRPI and BNSF's predecessor on maintenance of and capital projects for the Joint Line, as CNW was a co-owner of the Joint Line and paid for part of its maintenance and other operating costs on a usage basis and 50 percent of capital improvements made for the benefit of both carriers. (UP took over CNW's role with respect to the Joint Line when it acquired CNW in 1995.)

I founded RJM Consulting in 1994, after retiring from CNW. Since that time I have successfully completed numerous rail engineering/operating consulting

assignments relating to matters such as rail line construction and rehabilitation projects (including the proposed construction of a new line into the Powder River Basin by the Dakota, Minnesota & Eastern Railroad and the upgrading of DME's existing line to handle coal trains), maintenance projects, and line valuations.

II. Assignment

I have been asked by the Western Coal Traffic League and the Concerned Captive Coal Shippers ("Coal Shippers") to address safety issues related to the removal of accumulated coal dust deposited on railroad tracks (and in particular the Joint Line) by passing coal trains. In particular, I have been asked whether coal dust is routinely removed from the track structure, ballast and roadbed through normal and customary maintenance-of-way practices without adversely impacting the safety of train movements, or whether additional measures such as applying a surfactant to the tops of loaded coal cars at the mines to inhibit coal dust from blowing off the cars during transit are necessary for safety of operations.

In connection with this assignment I have reviewed various materials produced by BNSF during discovery in this proceeding. I have observed train operations in the PRB area (including the Joint Line) frequently since UP took over these lines from CNW, and I am familiar with the BNSF/UP activities in response to the two derailments on the Joint Line that occurred in May of 2005, allegedly due to heavy rains following the accumulation of coal dust in the track zone and roadbed. In this regard, I served as an expert witness for Omaha Public Power District ("OPPD") in a lawsuit OPPD filed

against UP in early 2007, involving the validity of UP's declaration of force majeure following the two derailments in May of 2005 (that case was subsequently settled). In the course of that engagement, I had occasion to evaluate the effect of coal dust blowing off or falling from coal trains on the Joint Line roadbed and ballast structure.

III. Safety Issues related to the Removal of Coal Dust

It is no secret that coal dust blows off loaded coal trains, or that more dust comes from coal trains on the Joint Line than in other areas due to the very high volume of coal traffic that moves from the mines served by (or reached via) the Joint Line. Indeed, I observed coal dust blowing from moving coal trains on numerous occasions after CNW/WRPI commenced operations on the Joint Line in 1984.

If allowed to accumulate in the roadbed and track zone in excessive amounts, coal dust can inhibit drainage of moisture, weaken the roadbed, and cause deterioration of rails, ties, switches and joints. Based on my observation, this is what happened on the Joint Line during a period of years prior to the two derailments in May of 2005. Excessive coal dust and other contaminants were allowed to accumulate, the ballast became fouled, and the roadbed and track structure became unstable due to a combination of these factors and sustained pounding by the frequent passage of heavy coal trains. The rain that occurred in the area prior to the derailments undoubtedly exacerbated the problem caused by the excessive accumulation of coal dust.

Coal dust accumulation is normally remedied by a sound railroad track-maintenance program that includes regular cleaning of the ballast to remove foreign

material on the surface, and undercutting the ballast itself. Undercutting involves the removal of foreign material (called "fines") that has seeped down into the ballast and roadbed. It removes the fouled ballast, screens out the fines (including coal dust and other material), and returns the cleaned ballast to the roadbed, thereby re-establishing efficient stormwater drainage.[1] Various tools and methods are available to the railroads to accomplish these tasks, including vacuum-type equipment to clean the surface of the ballast and the use of large on-track machinery such as shoulder cleaners and undercutters. Regular ballast cleaning increases the interval between undercutting programs, which are performed less frequently.

The frequency with which these programs should be carried out varies by line segment, depending on various factors such as the volume of coal traffic moving over the segment and the extent of deposition of foreign material onto the roadbed. BNSF is responsible for maintaining the Orin Subdivision, which includes the Joint Line, and materials produced by BNSF in discovery in this proceeding describe its current policies in this regard. BNSF's policy is that {

[1] Where significant quantities of foreign material such as coal dust have accumulated, as part of the undercutting process it can be loaded directly into open-top hopper cars or deposited along the right-of-way outside the roadbed area and subsequently collected and removed for disposal off-site.

}[2]

Undercutting every { } years appears reasonable to me for lines that do not carry large volumes of coal traffic. A line such as the Orin Subdivision clearly requires undercutting at more frequent intervals due to the large numbers of very heavy coal trains that move over this line. These trains cause the track structure and roadbed to deteriorate faster than on other lines, which leads to more rapid accumulation of fines in the ballast and roadbed. The fines that accumulate in the Orin Subdivision ballast and roadbed are not limited to coal dust, and include other materials such as dirt, sand, and particles from ballast and concrete ties that seep into the roadbed due to the impacts sustained from repetitive unit coal trainloads. All of these materials inhibit proper drainage of the track structure.

In my considered opinion, it is not necessary to inhibit or even prevent the deposition of coal dust into the roadbed from passing trains (e.g, by spraying a surfactant to bind the surface of the coal in railcars as a train is being loaded at the mine) to keep coal dust from becoming a train safety problem on high-density coal lines such as the Joint Line. If proper track and roadbed maintenance procedures such as those described above are followed, accumulation of substantial quantities of coal dust (and other fines) in the roadbed is prevented, proper drainage is not impeded, and the track structure and associated ballast does not become unstable. The risk of fires from accumulated coal dust is also minimized.

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[2] *See* { }.

Documents produced by BNSF in discovery show {

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After the derailments on the Joint Line in May of 2005, BNSF undertook an extraordinary program to remove accumulated coal dust, replace and restore ballast, and renew rail, ties and turnouts to remediate the problems caused by the deferred maintenance that had allowed large amounts of coal dust to accumulate in the Joint Line over an extended period. This program continued for about six months.

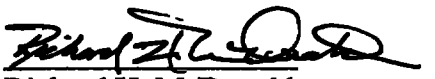
In the intervening years since the extraordinary 2005 coal dust removal program was undertaken, my understanding is that BNSF has increased the frequency of undercutting of the Orin Subdivision compared with the years prior to 2005, such that the intervals have been {

[3] *See* { }.

}. The result is that coal dust (and other fines) have not been allowed to re-accumulate in anything approaching the quantities that had accumulated by May of 2005, and there have been no derailments attributable to fouling of ballast by accumulation of coal dust and other ballast contaminants. This demonstrates that with proper maintenance practices the Orin Subdivision (and other lines that carry PRB coal) can be safely maintained and operated notwithstanding the continued deposition of some coal dust from passing trains.

VERIFICATION

I, Richard H. McDonald, verify under penalty of perjury that I have read the foregoing Verified Statement and know the contents thereof; and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.



Richard H. McDonald

Executed on: March 9, 2010

Viz

BEFORE THE
SURFACE TRANSPORTATION BOARD

FINANCE DOCKET NO. 35305

ARKANSAS ELECTRIC COOPERATIVE CORPORATION –
PETITION FOR A DECLARATORY ORDER

VERIFIED STATEMENT OF

MARK J. VIZ, Ph.D., P.E.

ON BEHALF OF

WESTERN COAL TRAFFIC LEAGUE
AND
CONCERNED CAPTIVE COAL SHIPPERS

Redacted, Public Version

DATED: MARCH 16, 2010

1. Introduction.

a. My name is Mark J. Viz. I am a principal engineer with Exponent, Inc., an engineering, scientific, health and environmental consulting firm headquartered in Menlo Park, California. I am based in Exponent's Wood Dale, Illinois, office. For the past eleven years I have performed engineering and/or engineering consultation work in a variety of aspects of mechanical performance, material handling, transportation and unintended releases of hazardous materials, and certain aspects of derailment cause and origin studies particular to rail transportation. From 2007 through 2009, I was the project manager and technical lead for a detailed study of coal loss, monitoring and measurement issues involving the movement of coal by rail on the "Joint Line" in the Powder River Basin. This study was funded by a consortium of member companies of the National Coal Transportation Association (NCTA). I have attached a copy of my current curriculum vitae (Exhibit MJV-1) to this statement.

b. I have been requested by the Western Coal Traffic League (WCTL) and the Concerned Captive Coal Shippers (CCCS), collectively referred to as "Coal Shippers," to analyze some of the means and methods that BNSF has used and apparently intends to continue to use to attempt to monitor and measure coal dust emissions from loaded railcars in transit. I have also been asked to comment on statements made by BNSF that claim (1), "BNSF has established coal dust emissions standards to protect against the fouling of ballast that occurs when a shipper's coal is released from a coal car during transit."[1] and (2), "Since BNSF's coal dust emissions standards are supported by scientific and engineering studies and data, they should not be disturbed."[2]

c. The content of this statement is organized as followed:

[1] "BNSF Railway Company's Reply to Arkansas Electric Cooperative Corporation's Petition for a Declaratory Order," p. 7.

[2] Ibid., p. 9.

i. Section 2. Summary of findings.[3]

ii. Section 3. BNSF's use of E-Samplers to monitor and measure *apparent* coal emissions from loaded railcars at MP90.7 on the Joint Line.

iii. Section 4. BNSF's assumptions of how well the E-Samplers at MP90.7 monitor and measure whatever is being drawn into them and how these assumptions are flawed.

iv. Section 5. BNSF's use of the E-Sampler output to calculate what they and their consultants term an "Integrated Dust Value" (IDV).[4]

2. Summary of findings.

a. BNSF's use of the MetOne E-Samplers at MP90.7 on the Joint Line has not been established to a reasonable degree of engineering certainty to monitor or to measure accurately coal emissions, if any, from passing loaded railcars in a train.

b. {

[3] For ease of reference, my statement focuses on BNSF's particulate monitoring on the "Joint Line" / Orin Subdivision. However, my conclusions are equally applicable to BNSF's particulate monitoring on the Black Hills Subdivision.

[4] When referred to as a *concept*, the term "Integrated Dust Value" or "IDV" is referred to in a general sense. However, when referred to as a *calculated quantity* or when a particular *numerical value* is assigned to "IDV," BNSF and Simpson Weather Associates have made a distinction between how IDV was first calculated and how it is calculated now. For calculations performed currently, BNSF and Simpson Weather Associates use the term "IDV.2". Some of the history and changes involved in the evolution of this questionable concept and how BNSF and Simpson have calculated it are detailed more fully in my statement.

}

c. BNSF's coal dust emissions standards and the use of the "Integrated Dust Value" (IDV) concept, which cannot be found referenced in any relevant open technical literature, are not supported to a reasonable degree of engineering certainty by the engineering studies and data that BNSF and its consultants have performed and presented to date. {

}[5] The calculated IDV / IDV.2, although of questionable meaning and interpretation, is a "derived" quantity from the analog output signal of the E-Samplers that apparently involves many computational steps.[6] {

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[5] {

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[6] As referenced and discussed elsewhere in my statement, BNSF has not produced the computer program that is used to calculate IDV and/or IDV.2.

[7] {

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3. BNSF's use of E-Samplers to monitor and measure *apparent* particulate coal emissions from loaded railcars at MP90.7 on the Joint Line.

a. BNSF's E-Samplers at MP90.7 are located horizontally, at a minimum, approximately { } from the nearest track.[8] Accordingly, the E-Samplers at this mile post are not necessarily measuring emitted particulates from a train that are then being deposited in the ballast but instead are attempting to measure airborne particulates at least { } from the nearest track that may then be deposited far away from the track itself. Also, to the best of my knowledge, BNSF has never performed field tests that could potentially measure the amount of particulate, if any, that is actually deposited in the ballast from any one passing train. The existing "dustfall collectors" could potentially be used for this measurement, but that would involve placing them in key locations in test pits in the ballast itself and not 10, 20 or even 80 feet from the tracks as they are currently positioned.

b. BNSF uses the E-Samplers in the field and in the laboratory in a "TSP" monitoring mode.[9] TSP stands for "total suspended particulates." The E-Samplers can also be used in a "PM10" mode, "PM2.5" mode or "PM1" mode in which a different inlet is placed on the collecting tube to only allow certain sized particles to enter the sampler. Since BNSF uses the TSP mode (with the TSP inlet), the E-Samplers will draw in any and all suspended particles that are allowed

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by the TSP inlet. In other words, the E-Sampler in TSP mode will monitor and measure anything that can be drawn into the collection tube. Since BNSF apparently has never operated the E-Samplers in the field or in the laboratory with the 47-mm filters that can be used with the E-Samplers, the material collected by the samplers has never been retained. Since the collected material has never been retained it has never been analyzed for content, particle size distribution and/or other characteristics that would help to identify what the collected material is. As a result, BNSF's statement that "... the fouling of ballast ... occurs when a shipper's coal is released from a coal car during transit" is not supported given the manner in which BNSF has used and continues to use the MetOne E-Samplers located at MP90.7 on the Joint Line. In simple terms, the E-Samplers as used by BNSF monitor and measure particulates that may or may not include coal dust.

c. BNSF goes on to state: "Clearly it is appropriate for BNSF to seek ways to keep the shippers' coal from blowing out of the coal cars and fouling the rail ballast."[10] This assumed causation, that coal blowing from coal cars fouls the ballast, is at the very heart of the issue of what methods can be used to establish with reasonable engineering certainty that this causal relationship exists, is quantitatively as-described and thus can be appropriately monitored and measured by the techniques adopted by BNSF. At issue here (for the purposes of my statement) is not whether there is coal in the ballast on the Joint Line, but rather whether the coal that may be in the ballast uniquely or even primarily comes from loaded railcars in transit and whether the amount of coal that may be in the ballast can be correctly monitored and measured using the devices put in operation by BNSF and definitively linked to the railcars as the source. As outlined herein, no evidence has been provided for my review in this matter that substantiates this claim to a reasonable degree of engineering certainty using the methods and data that have been used and are continued to be used by BNSF. In addition, {

[10] "BNSF Railway Company's Reply to Arkansas Electric Cooperative Corporation's Petition for a Declaratory Order," p. 8.

} It should also be noted that no evidence has been offered that the analytical laboratory work to analyze samples from the ballast was performed by an accredited facility and/or with the advantage of neutral third party involvement.

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ii. {

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iii. {

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iv. {

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[11] BNSF_COALDUST_0028394-0028396.

[12] BNSF_COALDUST_0028418.

[13] BNSF_COALDUST_0028574-0028581.

[14] {

}

v. Furthermore, consider statements from published technical literature that identify other sources of ballast breakdown / fouling:

1. "Five main sources of ballast fouling materials are ballast breakdown, infiltration from ballast surface, tie wear, infiltration from underlying granular materials and subgrade infiltration."[15]

2. "Previous research indicate[s] that ballast fouling materials mainly come from ballast breakdown."[16]

3. "[Ballast] materials which tend to create fines will fill the voids between the particles and could inhibit drainage. Some of the powdery fines of carbonate materials have a tendency to cement together and a clogging action could occur."[17]

4. "Track loading patterns and traffic density, weight of the rail section, grades, the cross section of the ballast section, the sub-ballast and the roadbed interaction together with climatic conditions are major considerations in the performance of the ballast materials."[18]

d. {

} Furthermore, it is likely that there are biases in the BNSF sampling procedures used at MP90.7 with respect to the two

[15] Selig, E.T. and Waters, J.M., *Track Geotechnology and Substructure Management*, first ed., published by Thomas Telford Services Ltd., London, 1994.

[16] Han, X. and Selig, E.T., "Effects of Fouling on Ballast Settlement," *Proceedings of the Sixth International Heavy Haul Railway Conference*, April 1997, p. 261. Note that Han and Selig's research at the University of Massachusetts Amherst was funded by the Association of American Railroads.

[17] AREMA 2007 Manual for Railway Engineering, vol. 1, chap. 1, sec. 2.10.3.e.

[18] AREMA 2007 Manual for Railway Engineering, vol. 1, chap. 1, sec. 2.10.3.h.

E-Samplers positioned on opposite sides of the track right-of-way. The E-Samplers are located at different distances from different tracks {

}[19] {

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4. BNSF's assumptions of how well the E-Samplers at MP90.7 monitor and measure whatever is being drawn into them and how these assumptions are flawed.

a. Perhaps the most troubling aspect of how BNSF uses the E-Samplers at MP90.7 is that they have been used and continue to be used without the use of the 47-mm filter. The importance of the filter is that it provides a "reference method" to calibrate the particulate concentration output signal from the E-Sampler (an electronic measurement) with the total particulate mass collected by the sampler over the same period of time (a physical measurement of particulate mass).

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Calibration of the E-Samplers is performed by computing a "K-factor." The K-factor is calculated by dividing the total dust concentration determined from the filter by the total dust concentration calculated from the summation of the real-time concentrations recorded by the E-Sampler over the same period of time. Both dust concentration values typically are expressed in units of mg/m^3 (milligrams per cubic meter). A K-factor of unity would indicate that the dust concentration determined from the filter and the corresponding electronic data from the E-Sampler are the same. Since the K-factor is meant to be a "correction factor" for the electronic real-time data, it must be calculated, otherwise there is no way to know whether the particulate concentration values from the light scattering measurements (electronic output) are correct. BNSF's failure to equip and use the E-Samplers with 47-mm sampling filters and its apparent failure to calculate K-factors renders the E-Sampler electronic data unusable for BNSF's intended purpose, namely, "...to protect against the fouling of ballast that occurs when a shipper's coal is released from a coal car during transit,"[21] because the amount of coal that may be released, if any, cannot be accurately measured and uniquely ascribed to railcars as its source.

b. The manufacturer of the E-Sampler, MetOne, clearly outlines the value and need to use both the light scattering (electronic) and gravimetric (filter) capabilities of the E-Sampler. However, it appears that BNSF throughout their work chose to completely avoid using the gravimetric method even though it is necessary to calibrate the electronic output of the sampler. A few direct quotes from the E-Sampler Operation Manual (E-Sampler-9800 Rev. G) outline the importance of both methods:

    i. "The E-Sampler is a combination of two technologies each with strengths and weakness. These two systems are light scatter as a measurement of

[21] "BNSF Railway Company's Reply to Arkansas Electric Cooperative Corporation's Petition for a Declaratory Order," p. 7.

airborne particulate and the gravimetric method for determination of airborne particulate." (p. 11)

ii. "The E-Sampler uses light scatter from suspended particulate to provide a continuous real-time measurement of airborne particulate. An internal visible laser diode is collimated and directed through sample air. This sample air is drawn into the E-Sampler by an internal rotary vane pump. Flow rate is controlled based on actual conditions for accurate cut-points through the sharp-cut cyclone. When particulate laden sample air intersects the laser beam a portion of the light is scattered. The scattered light is collected at a near forward angle and focused on a photo diode that converts the light to an electric signal proportional to the amount of scattered light. Forty measurements are made each second and averaged to update the data logged concentration every second." (p. 11)

iii. "Standard equipment on the E-Sampler is the 47 mm filter system. This system is the second method to obtain airborne particulate data. After the sample air has been measured by the light scatter system it is deposited on a 47 mm filter." (p. 11)

iv. "One of the most important uses for the 47 mm filter is determination of a gravimetric K factor for the E-Sampler. Light scatter can measure particulate incorrectly due to index of refraction or particle size. This has been a limitation with many light scatter instruments. The solution has been to perform a side-by-side comparison with a filter based manual sampler. Manual samplers weigh the 47 mm filter at standard conditions in a laboratory, then pull a known amount of air through the sample and finally reweigh the filter. The change in weight (micrograms) divided by the amount of air drawn (cubic meters) through the manual sampler is equal to the concentration (micrograms per cubic meter)." (p. 12) It is important

to note that no evidence has been provided for my review to substantiate that BNSF has ever performed a side-by-side comparison with a filter based manual sampler.

c. Documents produced by BNSF indicate {

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rotary vane pump, the humidity and temperature sensors, the digital-to-analog converter, etc.) calibrated in full compliance with the requirements outlined in the Met One "E-Sampler Operation Manual." Examples include:

i. BNSF has claimed that the E-Samplers "are exposed in the field for 2 months then shipped to the manufacturer for 'as received' testing, cleaning, and calibration."[28] The E-Sampler Operation Manual (E-Sampler 9800 Rev. G) states that a leak check, flow calibration, inlet cleaning and the alarm log should be performed / inspected on a monthly basis as stated in Table 3.3.5 of the manual. No information has been provided for me to review that BNSF and / or their consultants have performed these maintenance items on a monthly basis as required by the operation manual. {

}[29]

ii. It is not clear from the information provided by BNSF that the "Calibrate DAC" function (used to calibrate the concentration analog output) is performed on any regular basis and if so, how changes in the DAC calibration, if any are found, are accounted for when using the data output from the E-Sampler to correct IDV / IDV.2 calculations that may have been performed prior to the discovery of DAC calibration problems.

iii. {

[28] "BNSF Railway Company's Responses and Objections to the Second Set of Interrogatories and Requests for Production of Documents of Western Coal Traffic League and Concerned Captive Coal Shippers," p. 6.

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}

} The potential issues of analog output signal attenuation and E-Sampler digital to analog converter calibration problems may in fact point to limitations in using these devices for the type of particulate monitoring BNSF intends at MP90.7. {

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iv. BNSF has stated that, "Typically, the exposed dust monitors' signals are within 10% of a calibration unit...."[30] However, no information produced by BNSF has been provided for my review that identifies what is meant by a "calibration unit." This ambiguity in calibration standard raises questions about to what BNSF believes this calibration refers. It is possible that BNSF is simply referencing the E-Sampler Operation Manual for "manual span adjustment" that states: "Calibration fails when span reading is greater than ± 10% of factory reference." If in fact the manual span adjustment reference is the basis for BNSF's claim that the monitors' signals are within 10% of a calibration unit, this indicates that BNSF may be confusing the calibration of the output particulate concentration signal with an internal calibration of the manual span function. In fact, there are a number of internal / manual calibration procedures, such as those for the manual zero function, ambient temperature, barometric pressure, relative humidity, flow rate and DAC.

[30] "BNSF Railway Company's Responses and Objections to the Second Set of Interrogatories and Requests for Production of Documents of Western Coal Traffic League and Concerned Captive Coal Shippers," p. 6.

5. BNSF's use of the E-Sampler output to calculate what they and their consultants term an "Integrated Dust Value" (IDV and/or IDV.2).

a. BNSF and its consultant Simpson Weather Associates use a computer program to convert E-Sampler output ("raw" data from the analog output signal) into train-specific IDV or IDV.2 values. Coal Shippers requested this program in its entirety in discovery, but I have been informed that BNSF has not produced it. Without this program, BNSF's data reduction, conversion and IDV/ IDV.2 calculation process remains a "black box" that neither I nor likely anyone else without access to this program can study and replicate. BNSF's data reduction, conversion and calculation procedures and the validity, if any, of these procedures remains unknown and not able to be tested. What I have been able to review is a vaguely worded and ambiguous description (in words only) of the manner in which IDV / IDV.2 is calculated.[31]

b. BNSF and their consultant Simpson Weather Associates have repeatedly stated that the "Integrated Dust Value" is a non-dimensional number that somehow characterizes any given dust plume measured by an E-Sampler over a specified period of time.[32] In general, neither I nor any of my colleagues who have assisted me with this work have been able to find any citations in the open technical literature that refer to the concept of IDV (integrated dust value) or DUs (dust units). { }[33] {

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d. No engineering explanation has been provided in the documents produced to me to establish with reasonable engineering certainty that the manner in which BNSF and / or their consultants have decided to remove E-Sampler particulate concentration results for the time locomotives are passing or idling near the E-Samplers in fact completely removes the effect of diesel emissions on the dust concentration measurements.

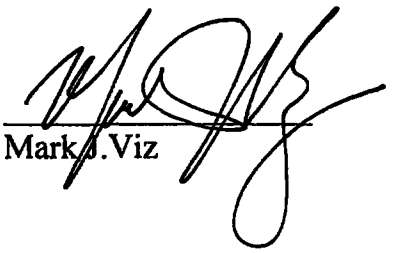
e. Even if the IDV concept were an appropriate indicator of the "dustiness" of a loaded train passing the E-Samplers at MP90.7, {

} This is troubling because the E-Samplers and the IDV concept suggest that even the best available dust suppression control technology does not reliably reduce apparent coal dust emissions to standards acceptable to BNSF. It is also telling that to the best of my knowledge not one dust suppressant manufacturer as of approximately a year ago was willing to guarantee that their product will quantitatively reduce apparent emissions to satisfy the compliance standard promulgated by BNSF. Furthermore, using laser scanning or other technology to monitor or "verify" that the loaded top-of-car profile meets the precise requirements of BNSF's "bread loaf" profile

negates the reality that the profile will likely change shape and settle or become partially redistributed as each loaded railcar is exposed to train handling forces (e.g., buff, draft, slack action, possible emergency brake application) and vibrations that neither the mines nor the utilities can control.

VERIFICATION

I, Mark J. Viz, Ph.D., P.E., verify under penalty of perjury that I have read the foregoing Verified Statement and know the contents thereof; and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.



Mark J. Viz

Executed on: March 15, 2010

Exhibit MJV-1

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Failure Analysis Associates

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Mark J. Viz, Ph.D., P.E.
Principal Engineer

Professional Profile

Dr. Mark J. Viz is a Principal Engineer in Exponent's Mechanical Engineering and Materials/Metallurgy practice. He specializes in performance evaluation and mechanical analysis of railcar and aircraft structures. He also specializes in risk, reliability, and mechanical integrity assessments of a variety of process plant equipment such as pressure vessels and tanks, and certain types of transportation vessels including railcar tanks, intermodal vehicles, and over-the-road tank trailers. Dr. Viz also has experience in component life reliability assessments, "repair or replace" risk decisions, and statistical analysis of in-service component performance. Other areas of Dr. Viz's specific academic expertise include nonlinear finite element analysis, metal and composite material testing, fatigue and fracture mechanics, and statistical data reduction methods. He has investigated and/or consulted in matters involving railcar derailments, tank car ruptures, releases of hazardous materials in transportation, coal mining haulage accidents, rotor failures, bus rollovers, pressure vessel explosions, and other industrial accidents.

Given his expertise in engineering mechanics, Dr. Viz also performs engineering evaluations and analyses involving the mechanical performance of a variety of machines and products. Some of these devices include elements of cranes and lifting devices (e.g., wire rope failures, hydraulic and valve failures), elements of elevators, a variety of industrial machines (e.g., printing equipment, CNC machine tools, pumps, compressors), certain aspects of machine guarding and lock-out/tag-out procedures, and specialized evaluations of consumer products. Dr. Viz's involvement in these types of cases typically involves the synthesis and execution of a variety of engineering mechanics calculations and analyses.

Prior to joining Exponent, Dr. Viz was a Product Development Engineer at the GATX Rail Corporation. His responsibilities included new rail car design and development, budget and schedule management, and sales and marketing support. Dr. Viz was also heavily involved in the regulatory environment concerning the transportation of hazardous materials in rail tank cars. Dr. Viz also served as a Specialist Engineer in the Structural Damage Technology group at the Boeing Company. He was responsible for the durability and damage tolerance analysis and testing of a wide variety of aircraft structures from wing and fuselage sections to individual fasteners. He has also taught probability, statistics, and mechanics of materials at the college level.

Academic Credentials and Professional Honors

Ph.D., Cornell University, Theoretical and Applied Mechanics, 1996
B.S., Massachusetts Institute of Technology, Aeronautics and Astronautics, 1990

Licenses and Certifications

Licensed Professional Engineer, Illinois, #062.062247
Mining Safety and Health Administration (MSHA) Part 46 and Part 48 trained
Respirator and SCBA fit-tested and trained

Publications and Presentations

Viz MJ. Failure analysis in the design cycle. Presented as a guest lecture for CIV-ENG 395-0 Engineering Forensics course, Evanston, IL, April 16, 2008.

Viz MJ, Momsen RH. Reliability and risk management of railcar truck castings in high mileage, high gross rail load service: A case study. Presented at the Annual Meeting of the Society for Risk Analysis, Baltimore, MD, December 5, 2006.

Morrison III DR, Ogle RA, Viz MJ, Carpenter AR, Su YS. Investigating chemical process accidents: Examples of good practices. Process Safety Progress 2006; 25:71–77, March.

Ogle RA, Morrison III DR, Viz MJ. Emergency response to a non-collision HAZMAT release from a railcar. Process Safety Progress 2005; 24:81–85, June.

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Zehnder AT, Viz MJ. Fracture mechanics of thin plates and shells under combined membrane, bending, and twisting loads. Applied Mechanics Reviews 2005; 58:37–48, January.

Ogle RA, Viz MJ, Morrison III DR, Carpenter AR. Bulk transportation of hazardous materials by rail: Lessons learned from non-collision accidents. Presented at the 2004 Annual Symposium, Mary Kay O'Connor Process Safety Center, Texas A&M University, College Station, TX, October 2004.

Ogle RA, Morrison III DR, Viz MJ. Emergency response to a non-collision HAZMAT release from a railcar. Presented at the 19th Annual CCPS International Conference, Emergency Planning: Preparedness, Prevention and Response, American Institute of Chemical Engineers, Orlando, FL, June 2004.

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Zehnder AT, Potdar YK, Viz MJ. Fatigue fracture in plates in tension and out-of-plane shear. Fatigue and Fracture of Engineering Materials and Structures 2000; 23:403–415.

Viz MJ. Fatigue fracture of 2024-T3 aluminum plates under in-plane symmetric and out-of-plane anti-symmetric mixed-mode deformations. Ph.D. Dissertation, Cornell University, 1996.

Potyondy DO, Viz MJ, Zehnder AT, Rankin CC, Riks E. Computation of membrane and bending stress intensity factors for thin cracked plates. International Journal of Fracture 1995; 72:21–38.

Viz MJ, Zehnder AT, Bamford JD. Fatigue fracture of thin plates under tensile and transverse shear stresses. Fracture Mechanics, 26th Volume. ASTM STP 1256, Reuter WG, Underwood JH, and Newman JC (eds), American Society for Testing and Materials, pp. 631–651, 1995.

Viz MJ, Zehnder AT. Fatigue crack growth in 2024-T3 aluminum under tensile and transverse shear stresses. Proceedings, FAA/NASA International Symposium on Advanced Structural Integrity Methods for Airframe Durability and Damage Tolerance. NASA CP-3271, pp. 891–910, 1992

Viz MJ, Zehnder AT, Ingraffea AR. Fatigue fracture in thin plates subjected to tensile and shearing loads: Crack tip fields, j integral and preliminary experimental results. Proceedings, 7th International Congress on Experimental Mechanics, Society of Experimental Mechanics; 1992: 44–50.

Prior Experience

Director of Applied Mechanics, Packer Engineering, 2001–2003
Product Development Engineer, GATX Rail, 1999–2001
Specialist Engineer – Structural Damage Tolerance, Boeing, 1997–1999

Project Experience

Directed, managed, and performed numerous rail tank car failure cause and origin investigations, most involving the release of hazardous materials. Projects typically involve extensive field investigations, including confined space entry of tank cars, mechanical and metallurgical analysis, mechanical integrity assessments, non-destructive examination, and sample collection.

Managed and performed numerous rail tank car loading and unloading incident investigations, often involving worker injuries or fatalities.

Investigated the unintentional uncoupling of mining service cars in a Virginia underground coal mine. The uncoupling resulted in a runaway car situation that lead to the fatalities of two miners. Project work included incident modeling and reconstruction, performance calculations, and inspections.

Actively directing a lengthy study involving the investigation of railroad track ballast fouling and coal dust mitigation evaluations for coal transport out of the Powder River Basin in Wyoming. Project work includes measurement of fugitive dust emissions, static and dynamic

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(over-the-road) monitoring of dust loss from railcars, cost analysis for proposed mitigation techniques, and analysis of health and safety issues.

Managed and performed projects for multiple clients involving the mechanical integrity assessment and fitness-for-service evaluations of railcar truck castings (bolsters and side frames). These projects have typically involved the development and implementation of non-destructive examination procedures for both on-car and off-car examination, cyclic fatigue testing, mechanical and metallurgical testing, engineering evaluation of test results with respect to mechanical performance, and development of engineering plans to manage fleet components over the projected remaining useful service life. Have presented findings to the Association of American Railroads (AAR) for multiple clients.

Performed risk, reliability, and mechanical integrity assessments for a variety of process plant equipment including piping and tanks. Select assignments have involved flash train tanks at a bauxite to alumina processing plant, piping and vessels at a district cooling ammonia refrigeration plant, liquid carbon dioxide storage tanks, baghouse equipment at cement kilns, and a variety of other equipment subject to OSHA PSM (process safety management) and EPA RMP (risk management plan) regulations.

Directed, managed, and performed numerous incidents involving the release of hazardous materials from transportation vessels, including rail tank cars, intermodal containers, and over-the-road tank trailers. Projects typically have involved extensive field investigations, including confined space entry of tank cars, mechanical and metallurgical analysis, mechanical integrity assessments, non-destructive examination, and sample collection.

Performed design evaluation and risk assessment of a manufacturer's new product offering that provides GPS location and condition monitoring of railcars while in-transit. System includes remote sensing, GPS and satellite uplink equipment, all packaged in a field-hardened package. Project work included FMEA (failure modes and effects analysis), reliability modeling, and predictions for warranty structuring and material compatibility analyses.

Performed mechanical performance and stress analysis calculations for a fleet of coal railcars that exhibited top chord and side sheet buckling failures. The project involved performing detailed field inspections of the damaged railcars, finite element analysis (FEA) of the cars, and a determination of the in-service loads that were needed to produce the exhibited damage.

Managed and performed a collision damage assessment and engineering repair oversight for a major accident involving a monorail train in the Pacific northwest. Project work included responsibility for oversight of repair plans, mechanical contractor selection and qualification review, quality assurance oversight, schedule analysis, and general technical consulting. Project involved extensive field work and multiple presentations to technical staff and insurance adjusters.

Performed numerous mechanical performance analyses/evaluations for a variety of machines and products including:

- Manufacturing machinery (printing and binding equipment, forming and cutting machines, product conveying equipment, certain types of CNC machine tools)
- Elements of machine guarding and lock-out/tag-out procedures (drum foamers, printing and binding equipment, packaging equipment)
- Elements of crane and lifting devices (e.g., scissor lifts), including wire rope failures, hydraulic cylinder failures, holding valve failures, and stability issues
- Elements of consumer product performance including structural performance and mechanical response.

Academic Appointments

- Adjunct Professor, Mathematics Department, Pierce College, WA

Professional Affiliations

- American Society of Mechanical Engineers—ASME (member)
- American Institute of Aeronautics and Astronautics—AIAA (member)
- Society for Risk Analysis—SRA (member)

Andrew

BEFORE THE
SURFACE TRANSPORTATION BOARD

FINANCE DOCKET NO. 35305

ARKANSAS ELECTRIC COOPERATIVE CORPORATION --
PETITION FOR DECLATORY ORDER

Verified Statement

Of

Dr. Gary M. Andrew
Senior Consultant
L.E. Peabody & Associates, Inc.

On behalf of

Western Coal Traffic League
And Concerned Captive Coal Shippers

Redacted, Public Version

Date: March 16, 2010

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__(GMA_2)	Errors in SWA Field Validation of Monitors
__(GMA_3)	Hypothetical Example of Consequences of Averaging Averages
__(GMA_4)	BNSF TSM Monitor Laboratory Validation Test Summary
__(GMA_5)	Standard Error of Difference Between Monitors Increases with Larger Value of IDV

I. INTRODUCTION

My name is Dr. Gary M. Andrew. I am a senior consultant with L. E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, financial, transportation, marketing, and fuel supply problems. I have spent most of my career evaluating statistical and operations issues related to railroads and other industries. My assignments in these matters were commissioned by railroads, producers, and shippers of different commodities. A copy of my credentials is included as Exhibit__(GMA-1) to this Verified Statement.

I have been requested by Western Coal Traffic League and the Concerned Captive Coal Shippers (collectively, "Coal Shippers") to review and analyze the data and statistical tests related to the evaluation of particulate monitors utilized by the BNSF Railway Company ("BNSF"). As part of its attempt to develop a reliable system of detecting coal dust from trains originating on the Orin Subdivision in Wyoming, BNSF ran numerous tests of the data gathered by E-Sampler TrackSide Monitors ("TSM"). Much of this data was gathered and analyzed for BNSF by Simpson Weather Associates, Inc. ("SWA").

The first step in any statistical analysis, the analyst must be assured that the data collected is indeed a well defined and generally accepted measure of the attribute to be studied. In this proceeding, coal dust emitted from the coal in a loaded train is the attribute that is attempting to be measured. BNSF's data gathering uses a measurement called the Integrated Dust Value (IDV). It is my understanding that this measure is neither "well defined" nor "generally accepted" and is the product of undisclosed computer programming that BNSF's consultant applies to raw data from the TSM's. From 40 years of observing coal trains in places such as Wyoming, I can attest that there is dust in the air from natural phenomenon (such as windblown soils) and from air currents generated by the train. Near the mines in the Powder River Basin the

previously existing coal dust on the ground in and near the right of way would be a major factor contributing to the airborne coal particles when a train passes. In addition to the problems of removing the effects of contaminants and existing coal particles from the samples gathered by BNSF or its consultant, there are concerns for the lack of definition and quality of the IDV measure due to the processing of the signals generated by the E-Sampler Track Side Monitors.

Because of the questions related to data quality in BNSF's analysis, I will not attempt to restate the statistical analysis performed by BNSF or its consultants. My critique of the analyses performed by BNSF and its consultants assumes the physical measurement problems are solved and the IDV properly interprets the TSM output. My use of the terminology and data used by BNSF and its consultants should in no way be interpreted as my acceptance of the current data collection system or the data generated by same as reliable. Furthermore, any uncertainties that such a system is shown to possess will further decrease the accuracy and precision of any statistical analysis.

My testimony is discussed below under the following topical headings:

II. Summary and Findings

III. Difference between the Accuracy and the Precision of a Measurement

IV. Field Validation by SWA

V. Ordinary Linear Regression Is Not Appropriate

VI. { }

II. SUMMARY AND FINDINGS

BNSF and SWA gathered extensive data and developed numerous analytical tests, { }, in an attempt to demonstrate that the TSM monitors would provide accurate readings of the particulate matter blown off the coal trains. BNSF's goal was to establish, with 95% confidence, that BNSF could identify loaded coal trains that produced an IDV that was more than 134,[1] regardless of whether the data was obtained from the TSM located to the east of the Joint Line or the TSM located to the west of the Joint Line (or the north and south TSM's in the case of the Black Hills Subdivision). Based on a regression equation applied to the IDV of 134, BNSF proposed to restrict trains from producing a 300 IDV for the Orin Subdivision.

Based on my review of BNSF's data and the approach BNSF used to attempt to show the statistical validity of that data, my conclusions are as follows:

1. The system for validating monitors developed by SWA is not usable and greatly underestimates the risk of identifying a train as contributing to BNSF's coal dust problem when it is not. Without reliable data and proper estimates of variation and a statistically derived decision rule for rejecting a monitor for low precision, the detection system is fatally flawed.

2. None of the work I have reviewed in this proceeding justified the recommendation to use 300 as the critical value to claim that the train has an IDV of 134 or above 95% of the time. The confidence level of such a system cannot be computed using the current theory applied by BNSF.

3. BNSF's use of simple linear regression to represent its statistical goal is inappropriate in this case. The measurement of the limits of the errors in BNSF's data is unknown.

[1] BNSF selected the IDV 134 level based on a pre-determined business goal of reducing emissions by 85%. *See* "2007_coal_conference_coal_dust_breakout[1].pdf"; *see also* BNSF_COALDUST_0042366-0042373 and BNSF_COALDUST_0071904-0071922.

4. {

}

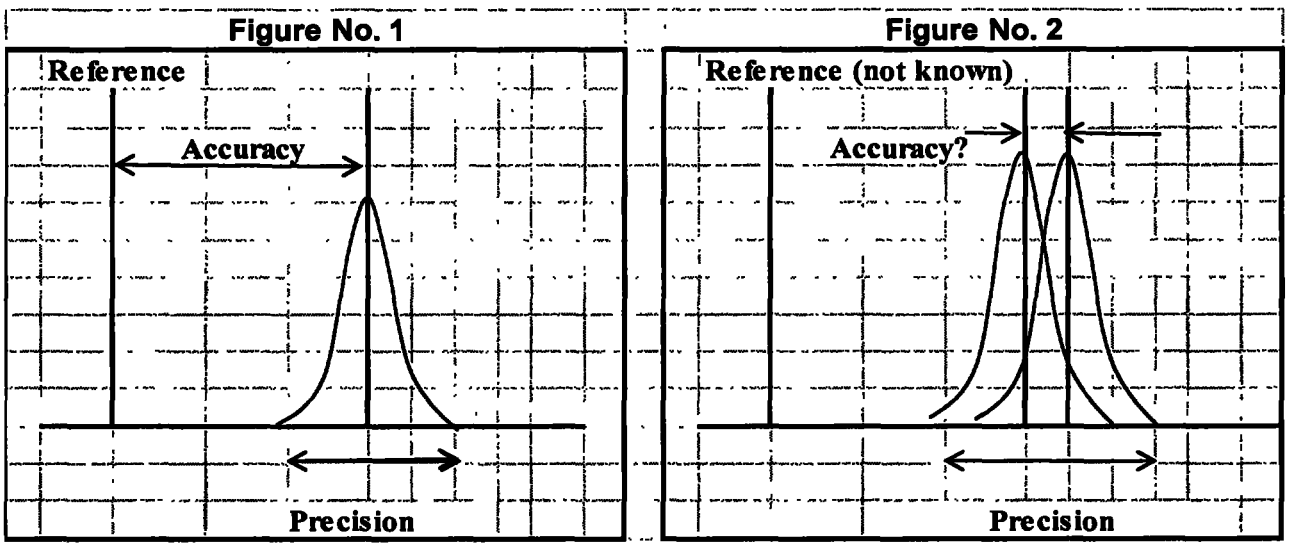
5. {

}

The details supporting my conclusions are discussed in the remainder of this Verified Statement.

III. DIFFERENCE BETWEEN THE ACCURACY AND THE PRECISION OF A MEASUREMENT

A meaningful evaluation of the BNSF's project for measuring the amount of coal dust emissions from loaded coal trains requires an understanding of both the accuracy and the precision of a measuring system. Figure 1 (below) gives visual definitions of these two terms assuming one set of data is gathered with an even distribution around the mean of that data. Precision is the reproducibility of the measuring system represented by the standard error of the system. Stated differently, how close together or spread apart are the individual measurements? The accuracy of the system is a measure of how close the mean of repeated measures is to the true (or reference) value. The further away the data points are from the reference point, the less accurate the data becomes.



The BNSF approach to measuring particulate concentrations, as illustrated in Figure 2 above, has an additional complication, i.e., there appears to be no reference value. In the BNSF's approach, instead of using a verifiable reference value to test a particulate monitor,

BNSF tested two monitors against each other. The difference between the values produced by two monitors will be influenced by both the variability (i.e., precision) and the mean value of each monitor. Two monitors with means very close together and high precision may give the impression of great accuracy when both monitors are very inaccurate. In other words, the statistical tests to determine the precision may produce a very favorable result but, as shown in Figure 2, the reference value may be very different.

Based on my review, almost all of the analyses BNSF used to develop a system to determine the "critical value", where a train would be labeled out of compliance, reflect an analysis of the differences between two particulate monitors. {

} Rather, the monitors are located on opposite sides of the railroad's right of way approximately 160 feet apart. Even if both monitors provide the same mean value in the field when they are tested side by side, there is no guarantee this mean is accurate, that is, near the true concentration of particulate. A configuration where the monitors are across the tracks creates further problems with determining the accuracy of the data gathered. This is a fatal error and makes the results of every effort by BNSF to analyze the data suspect.

Even ignoring this glaring error, BNSF's testing is flawed. However, my evaluation below of the system that should be used for determining the critical values assumes the mean

value of each individual monitor as developed by BNSF and SWA is sufficiently accurate to proceed. The continued analysis below should in no way be interpreted as accepting the mean values from BNSF's current system as accurate.

IV. FIELD VALIDATION BY SWA

BNSF's consultant SWA developed a field validation procedure to test monitors that were in use.[2] If SWA were using a reference monitor that is accurate as BNSF/SWA assumed, if the reference monitor were certain to remain accurate in the field, and if the laboratory conditions are certain to be maintained, this field validation arguably should reduce the problem of the reference point for both monitors being unknown. It should be noted, however, that I cannot determine if all of these assumptions are true in practice. Moreover, even with the knowledge that a reference monitor is accurate, any reading is subject to some error at least as large as the manufacturer's specifications. Furthermore, as shown below, these errors increase when particulate concentration increases. So any difference between the reference monitor and the monitor being validated has the following three components: 1) the measurement errors of the reference monitor; 2) the measurement of errors of the monitor tested; and, 3) whatever "drift" has occurred in the accuracy of the monitor being validated.

The SWA computations of "statistics" are incorrect for use in decision making. The objective of the test should be to make a decision to keep or replace the monitor being tested. This requires a decision rule with two parts: First, to test for accuracy based on the distance between the two means. Second, to test for precision to insure the monitor is not giving erratic readings as measured by a high standard error in the readings.

{

}[3] {

[2] {

}

[3] BNSF_COALDUST_0070782.

} Obviously averages should not be averaged and errors do not cancel.

The proper methodology is to compute an accepted statistical measure of the variation, usually the standard error of the difference between the two readings. With this statistic and knowledge of the variation of the reference, a statistical test could have been designed to determine whether the monitor being tested is giving erratic measurements. This was not done by SWA or BNSF.

{

} This is another illustration that errors do not cancel and averages do not average.

V. ORDINARY LINEAR REGRESSION IS NOT APPROPRIATE

Use of linear regression analysis requires certain conditions to be met to ensure estimates produced are correct. The simple regression equation used by BNSF in their analyses is:

$$Y = a*X + b + e$$

where a and b are constants, e is an error term that should be normally distributed with mean zero with constant variance and X can be any number in the range of observed data. The classical least squares method of estimating the values of a, b, and the variance introduced by the error term used by BNSF requires no measurement errors to occur in the observations of either X or Y. In BNSF's use of regression X and Y are simultaneous measurements taken by two different monitors and they both contain measurement errors[4]. If measurement errors did not exist, then, under laboratory conditions and if both monitors were properly calibrated, they should each give the same value. This is not the case in the laboratory tests reported in the documents provided by BNSF in this proceeding. Errors in measurements are the first violation of the assumptions underlying regression analysis using the method of least squares estimation.

There are advanced methods for treating "errors in measurements" (referenced later) but these methods generally require very large sample sizes and do not always provide satisfactory results and/or use numerical approximation. These advanced methods also require constant variation (as measured by the standard error) across all ranges of X to be analyzed. {

}[5] {

[4] In statistics and econometrics measurement errors are often referred to as errors in variables.
[5] Shown in Sheet: Data of Threshold Performance Standard 071001.xls.

}[7] {

} Therefore, the resulting prediction intervals used to calculate the TSM limit are incorrect and the true limit is unknown and unknowable. As noted in econometric analysis:

> "A badly measured variable contaminates all the least squares estimates. If more than one variable is measured in error, there is very little that can be said."[8]

Currently, there are no known closed form methods for solving the "measurement error" problem when the variability of the error is a function of the independent variable[9]. The

---

[6] The value that, when exceeded, flags the train as <u>not</u> meeting the standard.

[7] { }

[8] Green, William H., *Econometric Analysis* (5th ed.), Prentice Hall, New Jersey (2003), p. 86.

[9] Hald, A. , *Statistical Theory with Engineering Applications,* John Wiley, New York (1962) p. 615 shows a solution provided "...the 'true' value of the property and the error of measurement, are stochastically independent." The fact that the standard deviation of the error in measurement is a function of the property (particulate concentration) violates this provision. More recent references show newer approaches but all require large sample sizes AND constant variance of measurement error that do not exist in the BNSF measurements. See also Maddala, G. S., *Introduction to Econometrics* (3rd ed.), Wiley, New York (2001), p. 437ff.

variability (as measured by the standard error) of the measurement error of the BNSF system was just shown to be dependent upon the independent variable X.

VI. {

}

{

}[10] {

}[11]

{

}[12]

[10] BNSF_COALDUST_0044108-0044110 and 0044112.
[11] Email dated March 27, 2008 (BNSF_COALDUST_0062612).
[12] Email dated April 16, 2008 (BNSF_COALDUST_0044252). {

}

{

}[13] {

}[14] {

}[15]

{

}

[13] BNSF_COALDUST_0044244.
[14] {
[15] BNSF_COALDUST_0044426.

VERIFICATION

STATE OF COLORADO)
)
CITY OF LOUISVILLE)

I, Dr. Gary M. Andrew, verify under penalty of perjury that I have read the foregoing Verified Statement of Gary M. Andrew, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Gary M. Andrew

Sworn to and subscribed
before me this 10th day of March, 2010

My Commission Expires:

Registration Number:

JULIE MERCHANT
NOTARY PUBLIC
STATE OF COLORADO
My Commission Expires 03/18/2013

STATEMENT OF QUALIFICATIONS
OF
DR. GARY M. ANDREW

Dr. Andrew is a Senior Consultant with the economic consulting firm of L. E. Peabody & Associates, Inc. The firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, Virginia 22314, and 10445 N. Oracle Road, Suite 151, Tucson, Arizona 85737, and 21 Founders Way, Queensbury, New York 12804.

Dr. Andrew received a Bachelor of Arts degree in Mathematics from DePauw University in 1961, the Bachelor of Science in Management Science from Case Institute of Technology in 1961, the Doctor of Philosophy degree (Ph.D.) from Case Institute of Technology in 1966, majoring field in operations research, with a minor in statistics. He also completed every advanced course in statistics and econometrics offered at Case Institute of Technology between 1961 and 1964.

At Case Institute of Technology, Dr. Andrew taught courses in statistics, sampling and operations research, worked in the Case Operations Research Group and the Case Statistical Laboratory on research projects in theoretical and applied statistics, including transportation problems where he was a member of a research team that developed one of the first digital computer simulations of railroad operations for a division of the C&O Railroad.

From 1964 to 1971, Dr. Andrew taught courses and advised students and persons in business in theoretical and applied statistics, sampling, and operations research in the School of Business Administration and the Department of Statistics at the University of Minnesota,

Minneapolis. During this period, Dr. Andrew consulted with several railroads, truckers, airlines, and shippers and presented testimony before the Interstate Commerce Commission in numerous rates, abandonment and merger cases. He has also consulted on work sampling procedures, pricing decisions for several firms, and published articles in these fields.

In 1971, Dr. Andrew became Director of Planning and Analysis at the University of Colorado and, in June 1974, he was promoted to Vice Chancellor for Administration in charge of all support activities on the Boulder Campus including estimation, justification and cost control for over $50 million in construction for the University during his tenure and responsibility for both the United States Postal Service installation on the Boulder campus and the private mail system for the four campuses. Dr. Andrew was on the Graduate Faculty of the School of Business and continued his consulting practice in statistical sampling and estimation procedures in addition to his administrative responsibilities at the University of Colorado.

In September of 1978, Dr. Andrew resigned from the University of Colorado to devote full time to consulting and other business interests. He formed Infomap, Inc., a computer mapping and software firm specializing in the geographical display of statistical data, developed this company and sold it to Rand McNally and Company in 1983. Dr. Andrew worked as Director of Internal Consulting for Rand McNally until 1986.

For over 40 years, Dr. Andrew has worked with the firm of L. E. Peabody & Associates, Inc. as a consultant on various special projects. In January 1988, Dr. Andrew joined the firm as a Senior Consultant with L. E. Peabody & Associates, Inc. and his work has included the development of mathematical models of economic systems, statistical sampling procedures and statistical models for analyzing the relationship between costs and volumes in large data bases.

Dr. Andrew has, on numerous occasions, presented testimony in rate proceedings as an expert witness in mathematical modeling. Dr. Andrew presented testimony on costing models before the Postal Rate Commission in Docket No. R90-1, Postal Rate and Fee Changes, 1990, Docket No. R94-1, Postal Rate and Fee Changes, 1994 and Docket No. R97-1, Postal Rate and Fee Changes, 1997.

Dr. Andrew is a member of the American Statistical Association and the Institute for Operations Research and the Management Sciences. Dr. Andrew has published papers on statistics in recognized professional journals and has won awards for work in economics and statistics including the Carlton Prize in Economics at Case Institute of Technology and The Nicolas Andry Award for Outstanding Achievement in the Field to Orthopedic Surgery for his pioneering work in the application of statistical decision theory to treatment selection.

Dr. Andrew was a reviewer of and a contributor to The Guidelines for the Presentation of the Results of Sample Studies, Statement No. 71-1 (Interstate Commerce Commission, February 1971).

Exhibit GMA-2

REDACTED

Exhibit GMA-3

REDACTED

Exhibit GMA-4

REDACTED

BEFORE THE
SURFACE TRANSPORTATION BOARD

FINANCE DOCKET NO. 35305

ARKANSAS ELECTRIC COOPERATIVE CORPORATION --
PETITION FOR DECLATORY ORDER

Verified Statement

Of

Thomas D. Crowley
President
L.E. Peabody & Associates, Inc.

On behalf of

Western Coal Traffic League
And Concerned Captive Coal Shippers

Redacted, Public Version

Date: March 16, 2010

TABLE OF CONTENTS PAGE

LIST OF EXHIBITS

EXHIBIT NO. (1)	EXHIBIT DESCRIPTION (2)
__(TDC_1)	Statement of Qualifications
__(TDC_2)	Stipulation Between BNSF and WCTL
__(TDC_3)	Coal Dust Remediation Considerations

I. INTRODUCTION

My name is Thomas D. Crowley. I am an economist and the President of L. E. Peabody & Associates, Inc., an economic consulting firm that specializes in solving economic, financial, transportation, marketing, and fuel supply problems. I have spent most of my career of over thirty-nine (39) years evaluating fuel supply issues and railroad operations, including railroad costs, accounting, prices, financing, cost of capital, capacity and equipment planning issues. My assignments in these matters were commissioned by railroads, producers, and shippers of different commodities. A copy of my credentials is included as Exhibit_(TDC_1) to this Verified Statement.

I have been requested by the Western Coal Traffic League and the Concerned Captive Coal Shippers ("Coal Shippers") to review and analyze: 1) the cost that would be incurred to spray the coal cars with a dust suppressant in order to minimize the coal dust accumulating on the railroads' right of way, and 2) the costs incurred by the BNSF Railway Company ("BNSF") and Union Pacific Railroad Company ("UP") related to coal dust on the railroads' right-of-way utilized by Powder River Basin ("PRB") coal shippers on the Orin Subdivision[1] and other rail lines in Wyoming and Montana.

My testimony is organized below under the following topical headings:

II. Summary and Findings

III. Costs to Spray Coal Cars

IV. Maintenance Costs Recovered in Rates Paid By Shippers

V. Maintenance Costs Related to Coal Dust

VI. Conclusion

[1] The Orin Subdivision includes the rail lines between Donkey Creek, Wyoming (milepost 0) to Bridger Junction, Wyoming (milepost 127).

II. SUMMARY AND FINDINGS

After a review of the documents produced by the BNSF and UP in this proceeding as well as other publicly available data, I conclude that BNSF's problems with coal dust began long before the crisis created by the 2005 derailments on the joint line utilized by BNSF and UP in the Orin Subdivision. Also, in setting rail rates to transport PRB coal, the railroads have included the costs associated with the treatment of coal dust through traditional maintenance practices. BNSF's position is that spraying dust inhibitors on the loaded rail cars at the mines will result in less dust on the roadway. However, the costs of the spraying will be paid by either the coal company or the shipper which will constitute a double payment as the coal shippers already pay the costs of dealing with coal dust through normal maintenance which is included in the rates coal shippers pay to BNSF (and UP) for coal transportation. My understanding is that the BNSF (or UP) have not offered any rate relief to coal shippers to offset the reductions in maintenance costs that the railroads anticipate spraying would generate.

My specific observations and conclusions, as discussed in more detail in the remaining sections of this Verified Statement, are as follows:

1. {

}

2. BNSF's normal maintenance costs include the costs for cleaning ballast including removal of coal dust;

3. BNSF has acknowledged that the rates it charges coal shippers include the cost of roadway maintenance and, therefore, include the costs of removing coal dust;

4. Based on data provided by BNSF, {

   }

5. UP-provided data, as well as other materials, show that {

   } and

6. BNSF determined that {

   }

The details supporting my conclusions are discussed in the remainder of this Verified Statement.

III. COSTS TO SPRAY COAL CARS

BNSF documents present numerous scenarios which {

}[2] {

}[3] {

}[4] {

4.

}[5]

5. {

}[6] {

}

Based on a coal volume of { } million tons,[7] the {

}[8]

[2] See BNSF_Coaldust_0033558.
[3] See BNSF_Coaldust_0033560.
[4] See BNSF_Coaldust_0033653.
[5] See, e.g., BNSF_Coaldust_0019651. {
}
[6] See BNSF_Coaldust_0021542.
[7] {
}
[8] See BNSF_Coaldust_0020969 through 0020991. {

{

}[9] {

}

[9] See BNSF_Coaldust_0020972.

}[10] {

}[11] {

}

[10] See BNSF_Coaldust_0020990.

[11] Ultimately the shipper must bear any increased costs related to spraying. Even if the coal mines are required to pay for the cost of spraying, the coal mines will eventually be forced to pass these costs on to the shippers.

IV. MAINTENANCE COSTS RECOVERED IN RATES PAID BY SHIPPERS

While BNSF and UP portray the coal dust issue as involving increased and unexpected coal dust and associated maintenance costs, coal dust and such costs have always been an integral part of operating and maintaining a railroad in the normal course of business. Maintaining a sound roadbed requires that ballast and switches must be cleaned, undercutting must be performed and other normal maintenance functions addressed, which tasks entail significant costs.

As part of their discovery in this proceeding, the Coal Shippers requested the information from BNSF that would allow shippers to calculate the amount of maintenance costs BNSF recovers through its PRB transportation rates. BNSF objected to producing such information. To resolve this discovery dispute, BNSF counsel provided a letter that addressed the components included in coal rates set by BNSF. Specifically, this letter states that in setting rates:

> "...BNSF attempts generally to cover its variable costs, which include maintenance costs relating to ballast cleaning, undercutting and shoulder cleaning, and to generate contribution that will assist in covering fixed costs".[12]

BNSF's rates are compensating BNSF for the maintenance costs associated with ballast cleaning, undercutting and shoulder cleaning due to coal dust and other ballast contaminants. I now turn to a discussion of the amount of BNSF's roadway maintenance costs in the PRB.

[12] BNSF's letter is attached to this Verified Statement as Exhibit__(TDC- 2).

V. MAINTENANCE COSTS RELATED TO COAL DUST

My review of BNSF's maintenance practices and costs associated with its rail lines that originate the bulk of BNSF (and UP) coal traffic, is discussed under the following topics:

A. Causes of Contamination

B. BNSF Roadway Maintenance Costs

C. BNSF Deferred Maintenance

A. CAUSES OF CONTAMINATION

The contamination of ballast results from a number of causes. {

6. }[13]

{

[13] See BNSF_Coaldust_0020545.

}[14] {

}[15] {

}[16]

{

[14] See BNSF_Coaldust_0034270.
[15] See BNSF_Coaldust_0028396.
[16] See BNSF_Coaldust_0052031. {

}

}

B. BNSF ROADWAY MAINTENANCE COSTS

Documents produced by BNSF in discovery contain {

}

1. Actual, Budgeted And Normalized Roadway Maintenance Costs

{

}[17] {

}[18] {

}

2. BNSF Calculation Of Coal Dust Maintenance Costs

{

[17] See BNSF_Coaldust_0023672 through 0023675 and BNSF_Coaldust_0025225 through 0025228.
[18] See BNSF_Coaldust_0025225-27.

}[19] {

}

3. Zeta-Tech Maintenance Studies

In addition to developing its own analysis of coal dust related maintenance costs, BNSF retained Zeta-Tech Associates, Inc. ("Zeta-Tech") {

}[20] {

[19] See BNSF_Coaldust_0022781-82.
[20] See BNSF_Coaldust_0021333.

}[21] {

}[22] {

[21] See BNSF_Coaldust_0021342. {
}

[22] See BNSF_Coaldust_0022782.

[23] {
}

}[21] {

}[22] {

[21] See BNSF_Coaldust_0021342. {

}

[22] See BNSF_Coaldust_0022782.

}[23]

4. Appropriate Coal Dust Maintenance Cost Figure For <u>Comparison To Spraying Costs</u>

{

[23] { }

}[24] {

}

[24] See UP-AECCBN-007212 to 0007213.

C. BNSF DEFERRED MAINTENANCE

{ }[25] {

}[26] {

}[27]

{

}[28] {

}[29] {

}[30] {Table 1 below summarizes BNSF's modified maintenance plan.

---

[25] { }

[26] See BNSF_Coaldust_0025220.

[27] See BNSF_Coaldust_0025220.

[28] { }

[29] See UP-AECCBN-0006774.

[30] See BNSF_Coaldust_0025760.

Table 1

Summary of Planned Maintenance Activity for 2005 to 2009

(Orin Subdivision)

Item	2005	2006	2007	2008	2009
(1)	(2)	(3)	(4)	(5)	(6)
1. Undercutting – Miles	{ }	{ }	{ }	{ }	{ }
2. Ballast Shoulder Cleaning - Track Miles	{ }	{ }	{ }	{ }	{ }
3. Switches Cleaned	{ }	{ }	{ }	{ }	{ }

Source: BNSF_Coaldust_0025760

{

}[31]

{

}[32]

[31] See BNSF_Coaldust_0079575-649.

[32] As shown in Column (4) of Exhibit__(TDC-3).

VI. CONCLUSION

Based on my analysis of the costs of dealing with coal dust through spraying PRB coal trains {

} and the cost of maintaining BNSF's PRB lines in good operating conditions by dealing with coal dust through normal maintenance practices { }, it is clear that the spraying option is not economically sound. Although spraying would presumably reduce coal dust in some unknown and undemonstrated amount, and BNSF would achieve reduced maintenance of way costs to maintain its ballast, the additional costs forced upon utilities and their customers would far outweigh the amount of any savings to BNSF, and the overall societal costs of dealing with coal dust would be greatly increased.

VERIFICATION

COMMONWEALTH OF VIRGINIA)
)
CITY OF ALEXANDRIA)

I, THOMAS D. CROWLEY, verify under penalty of perjury that I have read the foregoing Verified Statement of Thomas D. Crowley, that I know the contents thereof, and that the same are true and correct. Further, I certify that I am qualified and authorized to file this statement.

Thomas D. Crowley

Sworn to and subscribed
before me this 16th day of March, 2010

Diane R. Kavounis
Notary Public for the State of Virginia

My Commission Expires: November 30, 2012
Registration Number: 7160645

STATEMENT OF QUALIFICATIONS

My name is Thomas D. Crowley. I am an economist and President of the economic consulting firm of L. E. Peabody & Associates, Inc. The firm's offices are located at 1501 Duke Street, Suite 200, Alexandria, Virginia 22314, and 10445 N. Oracle Road, Suite 151, Tucson, Arizona 85737, and 21 Founders Way, Queensbury, New York 12804.

I am a graduate of the University of Maine from which I obtained a Bachelor of Science degree in Economics. I have also taken graduate courses in transportation at George Washington University in Washington, D.C. I spent three years in the United States Army and since February 1971 have been employed by L. E. Peabody & Associates, Inc.

I am a member of the American Economic Association, the Transportation Research Forum, and the American Railway Engineering and Maintenance-of-Way Association.

The firm of L. E. Peabody & Associates, Inc. specializes in analyzing matters related to the rail transportation of coal. As a result of my extensive economic consulting practice since 1971 and my participating in maximum-rate, rail merger, service disputes and rule-making proceedings before various government and private governing bodies, I have become thoroughly familiar with the rail carriers that move coal over the major coal routes in the United States. This familiarity extends to subjects of railroad service, costs and profitability, railroad capacity, railroad traffic prioritization and the structure and operation of the various contracts and tariffs that historically have governed the movement of coal by rail.

STATEMENT OF QUALIFICATIONS

As an economic consultant, I have organized and directed economic studies and prepared reports for railroads, freight forwarders and other carriers, for shippers, for associations and for state governments and other public bodies dealing with transportation and related economic problems. Examples of studies I have participated in include organizing and directing traffic, operational and cost analyses in connection with multiple car movements, unit train operations for coal and other commodities, freight forwarder facilities, TOFC/COFC rail facilities, divisions of through rail rates, operating commuter passenger service, and other studies dealing with markets and the transportation by different modes of various commodities from both eastern and western origins to various destinations in the United States. The nature of these studies enabled me to become familiar with the operating practices and accounting procedures utilized by railroads in the normal course of business.

Additionally, I have inspected and studied both railroad terminal and line-haul facilities used in handling various commodities, and in particular unit train coal movements from coal mine origins in the Powder River Basin and in Colorado to various utility destinations in the eastern, mid-western and western portions of the United States and from the Eastern coal fields to various destinations in the Mid-Atlantic, northeastern, southeastern and mid-western portions of the United States. These operational reviews and studies were used as a basis for the determination of the traffic and operating characteristics for specific movements of coal and numerous other commodities handled by rail.

STATEMENT OF QUALIFICATIONS

I have frequently been called upon to develop and coordinate economic and operational studies relative to the acquisition of coal and the rail transportation of coal on behalf of electric utility companies. My responsibilities in these undertakings included the analyses of rail routes, rail operations and an assessment of the relative efficiency and costs of railroad operations over those routes. I have also analyzed and made recommendations regarding the acquisition of railcars according to the specific needs of various coal shippers. The results of these analyses have been employed in order to assist shippers in the development and negotiation of rail transportation contracts which optimize operational efficiency and cost effectiveness.

I have developed property and business valuations of privately held freight and passenger railroads for use in regulatory, litigation and commercial settings. These valuation assignments required me to develop company and/or industry specific costs of debt, preferred equity and common equity, as well as target and actual capital structures. I am also well acquainted with and have used the commonly accepted models for determining a company's cost of common equity, including the Discounted Cash Flow Model ("DCF"), Capital Asset Pricing Model ("CAPM"), and the Farma-French Three Factor Model.

Moreover, I have developed numerous variable cost calculations utilizing the various formulas employed by the Interstate Commerce Commission ("ICC") and the Surface Transportation Board ("STB") for the development of variable costs for common carriers,

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with particular emphasis on the basis and use of the Uniform Railroad Costing System ("URCS") and its predecessor, Rail Form A. I have utilized URCS/Rail form A costing principles since the beginning of my career with L. E. Peabody & Associates Inc. in 1971.

I have frequently presented both oral and written testimony before the ICC, STB, Federal Energy Regulatory Commission, Railroad Accounting Principles Board, Postal Rate Commission and numerous state regulatory commissions, federal courts and state courts. This testimony was generally related to the development of variable cost of service calculations, rail traffic and operating patterns, fuel supply economics, contract interpretations, economic principles concerning the maximum level of rates, implementation of maximum rate principles, and calculation of reparations or damages, including interest. I presented testimony before the Congress of the United States, Committee on Transportation and Infrastructure on the status of rail competition in the western United States. I have also presented expert testimony in a number of court and arbitration proceedings concerning the level of rates, rate adjustment procedures, service, capacity, costing, rail operating procedures and other economic components of specific contracts.

Since the implementation of the *Staggers Rail Act of 1980*, which clarified that rail carriers could enter into transportation contracts with shippers, I have been actively

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involved in negotiating transportation contracts on behalf of coal shippers. Specifically, I have advised utilities concerning coal transportation rates based on market conditions and carrier competition, movement specific service commitments, specific cost-based rate adjustment provisions, contract reopeners that recognize changes in productivity and cost-based ancillary charges.

I have been actively engaged in negotiating coal supply contracts for various users throughout the United States. In addition, I have analyzed the economic impact of buying out, brokering, and modifying existing coal supply agreements. My coal supply assignments have encompassed analyzing alternative coals to determine the impact on the delivered price of operating and maintenance costs, unloading costs, shrinkage factor and by-product savings.

I have developed different economic analyses regarding rail transportation matters for over sixty (60) electric utility companies located in all parts of the United States, and for major associations, including American Paper Institute, American Petroleum Institute, Chemical Manufacturers Association, Coal Exporters Association, Edison Electric Institute, Mail Order Association of America, National Coal Association, National Industrial Transportation League, North America Freight Car Association, the Fertilizer Institute and Western Coal Traffic League. In addition, I have assisted numerous government agencies, major industries and major railroad companies in solving various transportation-related problems.

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In the two Western rail mergers that resulted in the creation of the present BNSF Railway Company and Union Pacific Railroad Company and in the acquisition of Conrail by Norfolk Southern Railway Company and CSX Transportation, Inc., I reviewed the railroads' applications including their supporting traffic, cost and operating data and provided detailed evidence supporting requests for conditions designed to maintain the competitive rail environment that existed before the proposed mergers and acquisition. In these proceedings, I represented shipper interests, including plastic, chemical, coal, paper and steel shippers.

I have participated in various proceedings involved with the division of through rail rates. For example, I participated in ICC Docket No. 35585, *Akron, Canton & Youngstown Railroad Company, et al. v. Aberdeen and Rockfish Railroad Company, et al.* which was a complaint filed by the northern and mid-western rail lines to change the primary north-south divisions. I was personally involved in all traffic, operating and cost aspects of this proceeding on behalf of the northern and mid-western rail lines. I was the lead witness on behalf of the Long Island Rail Road in ICC Docket No. 36874, *Notice of Intent to File Division Complaint by the Long Island Rail Road Company*.

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February 26, 2010

Via E-Mail

Frank Pergolizzi, Esq.
Slover & Loftus LLP
1224 17th St., N.W.
Washington, D.C. 20036

Re: ***Arkansas Electric Cooperative Corporation – Petition for Declaratory Order***
Finance Docket No. 35305

Dear Frank:

I am writing in response to your February 11, 2010 letter to me regarding BNSF's responses to WCTL's discovery requests. In your February 11, 2010 letter, you raised questions about BNSF's objections to producing information relating to BNSF's internal management cost information or methodology. To address your concerns, I can state, as BNSF's counsel in Finance Docket No. 35305, that BNSF sets coal rates based on market conditions. In setting market-based rates, BNSF attempts generally to cover its variable costs, which would include maintenance costs relating to ballast cleaning, undercutting and shoulder cleaning, and to generate contribution that will assist in covering fixed costs.

Sincerely,

Anthony J. LaRocca

Exhibit TDC-3

REDACTED